

John M. Ostrowick

“Whether God Exists”

Thesis Presented for the Degree of

DOCTOR OF PHILOSOPHY

in the Department of Philosophy

UNIVERSITY OF CAPE TOWN

14 April 2017

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

With thanks to:

My wife, Joanna, for supporting me all the years that I was writing this;

My mother-in-law, Jane, for babysitting my sons while I worked on it;

My friends over the years, for all the interesting discussions,

Particularly Brett and Tyler, who helped me in a difficult time,

My research supervisors, in chronological order:

Campbell Brown (Edinburgh)

Alasdair Richmond (Edinburgh)

Jack Ritchie (Cape Town)

My external examiners,

for taking the trouble to read the work and give me valuable feedback

And last but not least, my parents, Ivy and Richard, for letting me make up my own mind.

Abstract

This thesis presents inductive and probabilistic arguments for and against theism. The thesis claims that the only compelling evidentialist argument for theism is the cosmological argument from Richard Swinburne. Swinburne's argument is examined from a Bayesian perspective, and it is found that we can't fix the prior probabilities that Swinburne needs, not even by his appeal to simplicity. We then explain that this undermines P-inductive arguments, in particular, the cosmological argument. Then we consider whether theism offers a good explanation for the universe, or has a high likelihood, even if God is not simple. We find that there is no good reason to say that theism explains the universe better than competing theories. We therefore conclude that there is no C-inductive argument from cosmology to theism either. We then debate the physicalist explanations of the universe, which turn out to not help the atheist. We might feel that this leaves us in an argumentative stalemate, but in the final chapter, we turn to the problem of evil. We discuss the possible existence of gratuitous evils (evils which achieve no good ends). We then argue that the most plausible response to gratuitous evil is Skeptical Theism, that is, that we are unable to know God's intentions. But that stance undermines the cosmological argument which requires that we know God's intentions. We then conclude that, given that the cosmological argument is the most compelling evidential argument for theism, and that it fails, that the theist should abandon natural theology. Therefore, holding the fideist/voluntarist position, or that God is in fact indifferent to us, are found to be stronger stances.

Table of Contents

1. Introduction	10
Why the question of God's existence matters	10
Evidentialism	10
Physicalism, Theism and Science	11
Who is God?	12
No deductive arguments	13
Why Cosmology	15
Structure of the Thesis	19
2. An Introduction to Bayesian Reasoning	21
Introduction: Scientific Confirmation and Evidence	21
What is Bayes' Theorem?	22
The Total Probability Rule	24
Reciprocal Support	26
A scientific example	26
P-inductive and C-inductive	28
The Base Rate Fallacy	29
3. The Problem of the Priors	33
Introduction	33
The Priors and Subjectivity	34
Ways of setting priors: Appeal to empirical frequencies	35
Objective Bayesianism: The principle of indifference — What is it?	36
Contemporary accounts of Objective Bayesianism	37
Convergence of the Priors, or "Washing away" the priors	39
Conclusion	41
4. Swinburne's Argument for Theism's Simplicity	42
Introduction	42
Swinburne's argument	42
Swinburne's <i>quantitative</i> argument for God's simplicity	42
Swinburne's <i>qualitative</i> argument for God's simplicity	43
Swinburne's <i>personal</i> argument for God's simplicity	45
Using Bayes' Theorem to present the Cosmological Argument	48
5. What is simplicity, and should we favour simpler hypotheses?	50
Introduction	50
Swinburne's models of simplicity	52
Discussion: Senses 5, 6, 7: Mathematical Simplicity, Few Variables, Few Laws	54
Criticisms	56
Conclusion	69
Appendix to Chapter 5: Old Evidence and Background Knowledge	70

6. Is God Simple?	72
Introduction	72
I. The Doctrine of Divine Simplicity	73
II. The Divine Complexity Argument (DCA)	76
Objections to DCA	79
III. Persons are not simple	83
Conclusion	85
7. Gwiazda's Argument	86
Introduction	86
The Complexity Quotient	86
PITI	90
8. Is theism a good explanation?	92
Introduction	92
What makes an hypothesis "good"?	92
Prediction versus Retrodiction	93
Swinburne's Cosmological Argument	95
Swinburne's cosmological argument: Summary	102
Criticisms	103
Finding a value for P(e)	112
Conclusion	113
9. Can some Multiple Universe Theory answer the theist?	115
1. Is our universe in fact very improbable?	117
2. Multiple Universes	117
3. The Principle of Mediocrity	121
Divine Indeterminacy is not the same as MUT	123
Pulsating Universe Theory (PUT)	123
Quantum Tunnelling and PUT	125
Problems for MUT and PUT	126
Conclusion	130
10. Does the Pulsating Universe Theory involve an Inverse Gambler's Fallacy?	132
Analogies for Multiple Universes	133
The Gambler's Fallacy and the Inverse Gambler's Fallacy	133
Is PUT an instance of the IGF?	135
Objections to Hacking's Argument	138
Conclusion	146
11. Gratuitous Evil, Theodicy, and Skeptical Theism	148
Introduction: Why would God create a universe with evil?	148
The Argument from Gratuitous Evil	149
Plantinga's response and Evidential Relevance	151
Theodicies	153
Free-will Theodicy	153
Objections to Free-will Theodicy	154
Soul-making theodicy, and evil as a means to greater good	155
Objections to SMT	157

Bayesian Conclusion	161
Skeptical Theism	161
The demand for consistency	168
Inscrutability, Skeptical Theism, and Simplicity	172
Conclusion — the Hypothesis of Indifference	172
12. Conclusion	173
Bibliography	177

Table of Figures

Figure	Title	Chapter : Page
1.	Probability of Disease	4 : 31
2.	Simple and Complex Hypotheses	5 : 55
3.	Hubble-Hawking-Einstein Classic “Big Bang”	8 : 104
4.	Hawking-Penrose Quantum “Big Bang”	8 : 104
5.	Multiple Universes Theory	9 : 118
6.	Universe Ensemble	9 : 118
7.	Probability curve of a universe like ours	9 : 121
8.	Pulsating Universe Theory	9 : 124
9.	The series of universes	9 : 124
10.	Borde-Guth-Vilenkin Model	9 : 126

Formulae Used

Bayes’ Theorem:
$$P(h|e \& k) = \frac{P(e|h \& k) \times P(h|k)}{P(e|k)}$$

Total Probability Rule (TPR):
$$P(e|k) = P(h|k)P(e|h \& k) + P(\sim h|k)P(e|\sim h \& k)$$

Reciprocal Support:
$$P(e|h \& k) > P(e|k) \text{ iff } P(h|e \& k) > P(h|k)$$

Table of Common Abbreviations

Abbreviation	Meaning
* or '	Primed; a variation on a proposition or property
a	Number of adjustable parameters, see also n
A	Any action, see also S
α	Our universe (rigid designator), see also e, E
AP	Anthropic Principle
β	Some universe other than ours, see also E'
c	The speed of light
e, E	Evidence, usually our universe, see also α
E'	Some universe other than ours, see also β
G	God, or the hypothesis of theism, sometimes written h or h_t
GE	Gratuitous evil
h	Hypothesis, usually theism, in this work, see also G, h, h_t
H/T	Heads and Tails (of a coin)
HI	Hypothesis of Indifference
h_m	The hypothesis of materialism/physicalism, sometimes written $\sim h$ when only theism and physicalism are in contention
h, h_t	The hypothesis of theism, sometimes written G or just h
i, j	Iterations, versions of
iff	If and only if
k	Background knowledge
L	Likelihood, P(elh)
MUT	Multiple Universes Theory (Carter)
\square	Necessarily that
n	Number or quantity, usually of entities in the universe
O	Observer-containing region of space-time
\diamond	It is possible that
P	Probable that
PUT	Pulsating Universe Theory (Wheeler)
S	Any specific agent or person, see also A
T, t	A specific time, e.g. $t=0$ (the start of time), t_1 (the first time instance)
UGD	Universe Generating Device
x	Any object or particular phenomenon

1. Introduction

Colossians 2:8: "Beware lest any man spoil you through philosophy."

Why the question of God's existence matters

The question of the existence of God is an ancient one, debated even in Ancient Greece. But why should we be interested in it? Well, firstly, in itself, it is an interesting question; for example, we might wonder, if God is good, why is there evil? But secondly, it seems that God, or even just the belief in him, has had a major influence upon the formation of our culture and has provided us with moral guidance (cf. Ariely, 2009, p208), meaning in life, as well as explanations for the origins of life and the cosmos (Swinburne, 2004, p6 et seq.). So, the theory seems to have great value.

There is, moreover, a further pressing need to answer this question, in view of the political instabilities in the Northern Hemisphere. It is not hard to see that one cause of the violence we are witnessing is due to religious intolerance. Some religious texts also contain clear promotions of violence against 'enemies', 'blasphemers' and 'unbelievers,'¹ and it seems as if some adherents take these admonitions seriously. It thus seems to be important to decide if religious texts have any possibility of legitimacy, by first interrogating whether God exists.

From the perspective of epistemology, the question is also interesting. It is generally taken that when pronouncing that one "knows" something, that one has justification for belief. Yet it is clear, when asked, that many theists refer to "faith" rather than "evidence". As such, the question of what counts as justification of a belief, in order to be able to say one "knows", is of some interest in this context.

Evidentialism

In a thesis like this we cannot hope to answer such wide-ranging questions about truth, conclusively. So a number of assumptions will need to be made in order to keep the discussion manageable. The majority of this thesis therefore discusses whether there is evidence for (or against) theism, that is, we will assume that belief is only justified by evidence. We will approach the question of theism, then, from this 'evidentialist' standpoint. This is the approach that Richard Swinburne follows, and as will become clear, his work is a major foil for our discussion.

¹ e.g., Psalms 137:9, 139:21-22, Deuteronomy 13:6-15, 17:3-5, Jeremiah 9:4-6, Leviticus 24:16, Surah 4:89.

“Many philosophers have urged the *evidentialist* objection to theistic belief; they have argued that belief in God is irrational ... because, as they say, there is insufficient evidence for it. ... theologians — in particular, those in the great tradition of natural theology — have claimed that belief in God is intellectually acceptable, but only because the fact is there is sufficient evidence for it.” (Plantinga, 1981, p41, Plantinga’s emphasis).

But not all theists take it as necessary that the theist has to provide evidence to support the hypothesis of the existence of God. Indeed, most “men on the street”, when asked why they believe, simply state that they “have faith”.

“[F]aith is really a special case of knowledge.” (Plantinga in Plantinga and Tooley, 2008, p12).

In the class of philosophers who argue that we can accept propositions as true without evidence, we find William James, John Bishop (2007a, 2007b, 2013) and Alvin Plantinga,² who all claim that it is rational to hold the belief in God, without relying on evidence (Plantinga, 1981, p42); for in some cases there may be pragmatic, as opposed to epistemic reasons to believe.

Naturally, in a short piece such as this, we cannot do justice to the debate between evidentialists and fideists, so I ask the reader’s indulgence in tolerating the reliance on evidentialism throughout the remainder of this thesis. In part, what the thesis will seek to do, is to show, by criticising evidence presented by natural theology, that there are no compelling evidentialist arguments for theism, since the strongest argument from natural theology fails. This may make space for a kind of fideism as the most reasonable theist position, but it will not be part of this thesis to argue for that conclusion.

Physicalism, Theism and Science

In this thesis, I will mostly contrast theism to physicalism.³ Theologians often accept that the pronouncements of science are largely true; and thus, the findings of science do not

² Plantinga calls his position “Reformed Epistemology”, whereas Bishop prefers the term “Fideism”, which he says includes Plantinga’s position (Bishop, 2007a, p389).

³ In this thesis, I do not distinguish between materialism (that everything is matter) and physicalism (that everything that exists is physical) (cf. Lewis, 1983, pp361-2), or philosophical physicalism/materialism (that everything can take a naturalistic explanation), as these distinctions have no bearing on the argument presented. I will generally, however, refer to “physicalism”.

necessarily contradict theism. Indeed, there are very few scientific theories that seem to threaten theism.⁴ Hence, we are not comparing and contrasting theism and science, but theism and physicalism — the view that there is nothing over and above the material universe. By contrast, theists hold that although there is a physical universe, there is indeed something over and above it: God. So what do we mean by “God”?

Who is God?

There are, of course, many characterisations of God. Following the literature, I will refer to the kind of God found in scriptures as the god of “Expanded” or “Extended” Theism. The kind of God that we will be discussing, for want of a better term, is that God as is characterised by Western philosophy; a God derived from the Bible, but nonetheless more transcendent and abstract (Samuelson, 1972). This hypothesis is what I will call, again following the literature, “Restricted Theism.”

Swinburne presents a version of restricted theism, and argues that God has certain properties to an infinite degree: omnipotence, omniscience, omnipresence, and omnibenevolence (Swinburne, 2004, pp7-8). I will sometimes use the term “omnifarious” as shorthand for this description of God. For now, I ask the reader to take it that this is the conventional view. We will explain Swinburne’s reasoning for these characteristics in Chapter 4, where he argues that infinite properties are the most simple, and we will contest his characterisation (that these properties are simple) in Chapter 6, after defining simplicity in Chapter 5.

It is important to add that Swinburne, in particular, considers God to be “factually necessary” and contingent, rather than ontologically necessary (2004, p148). I mention this because orthodoxy usually holds that God is ontologically necessary. The reason this is particularly interesting, as we will see, is that firstly, if the ontological argument succeeded, no empirical or inductive arguments would be needed. Indeed, it would simply be irrational to disbelieve. We will discuss Swinburne’s reasons for discarding the ontological argument a bit further below.

God is also taken to explain the universe (both its origin and its continued existence), but not himself require explanation (Swinburne, 2004, p96). But we should not consider God’s being a creator to be a necessary feature of restricted theism. For, as we shall see, Swinburne tries to argue *from* restricted theism *to* creationism. Swinburne’s tactic, which we’ll see as we progress through the thesis, is to argue that a universe such as this one is much more likely given the God of restricted theism, than not.

⁴ See e.g. Ostrowick (2013) for a defence of the theory of evolution in a theistic context.

Types of Theism

Expanded theism, in contrast to the ‘restricted theism’ characterised above, has many varieties, including all known Abrahamic religions. I will sometimes discuss ideas from some versions of expanded theism. This is particularly true in the case of the problem of evil. Expanded theism(s) include propositions like, “Jesus is the son of God who came to earth to die for your sins”, or “The afterlife exists and is the reward for righteousness”, or “Evil exists to test your deserving of heaven” — propositions which do not follow from any deductive argument which has the propositions articulating restricted theism as its premises (cf. Hasker, 2002, p255). These propositions, however, might follow from a probabilistic argument.

I will also omit serious consideration of polytheism, as I agree with Swinburne that this view is problematic in some probably fatal ways (Swinburne, 2004, p147). Swinburne does not, however, appear to directly address or reject pantheism, a view which I find more plausible than theism.⁵ Then there is also, of course, deism — the view that God created or set up the world and the laws of science, and then sat back to watch the results, never intervening.⁶ We’ll see a brief argument for deism at the end of the thesis.

Of course, these models of God are all plausible to greater or lesser degrees, and should be considered in more detail; however, for reasons of space, this will be impractical. The point of this section is, really, to show that Swinburne’s triad of polytheism, physicalism, and theism, do not really exhaust the possibility space, and introducing each new variety of theism (or atheism) reduces the probability of restricted theism in particular being true, in virtue of just taking up a slice of the probability space. We’ll discuss this issue further in Chapter 3 when we discuss the *principle of indifference*.

No deductive arguments

Following Swinburne (2004, p17), I will also not go into detail on what may be called the *deductive* arguments for God’s existence. Many of the original arguments about God’s existence, all the way from the Ancient Greeks through to the medieval scholars, were of this type.⁷ The hope was that you might be able to show, by sheer logical necessity, that God either existed or did not exist.

An example of an argument of this type, which we’ve already met, is the Ontological Argument, introduced by St. Anselm (ca. 1033-1109). St. Anselm argued that since God is

⁵ See Ostrowick, 2016 for a defence of a version of pantheism.

⁶ *Jewish Encyclopedia* (1906). “DEISM: A system of belief which posits God’s existence as the cause of all things, and admits His [sic] perfection, but rejects Divine revelation and government, proclaiming the all-sufficiency of natural laws.” Also in Swinburne, 2004. p94.

⁷ One makes an exception for the argument from evil.

perfect, he is the best entity that can exist; and no being either in the mind or reality could be better. And since existence is a kind of perfection (i.e. things that don't exist are less-perfect or imperfect), it must be the case that, as the most perfect being, God certainly exists.

The key issue with this argument is the assumption that perfection entails existence, which is dubious, although there are other objections. The logic is, however, apparently valid.⁸ St. Anselm seems to be trying to argue that “existence” is necessarily one of God's properties, like “three sides” is necessary for something to be a triangle. Kant, however, replied to St. Anselm by arguing that existence is not a predicate.⁹ This counter-argument claims that it is redundant to add “and the being exists” to any description of any being. So, where “O” is “omnifarious”, the phrase “God is omnifarious”, is rendered symbolically as $\exists G:O(G)$, which means the same as “God is omnifarious, and he exists” [$\exists G:O(G)$]. So since “and he exists” adds no new information, we should not consider existence to be a predicate.¹⁰ There are other responses available. For example, “Being told that existence is implicit in [God's] definition does not *actually* make him exist,” (Howson, 2011, p130). Similarly, we might say “there exists a number x such that $x = 1$ ”.

Swinburne rejects the Ontological Argument. Let's see why. Swinburne provides a hierarchy of types of explanations; namely, *Full*, *Complete*, *Ultimate*, and *Absolute* explanations. A *full* explanation merely gives the most recent necessary and sufficient conditions for an event (2004, p76). A *complete* explanation is a *full* explanation for which the causal factors themselves do not have explanations (that is, the explanation ends there, and there are no further explanations available) (2004, p78). An *ultimate* explanation is a *complete* explanation for which we have many explanatory causes, stretching back in time, but at some point, we have a first cause for which we have no explanation; it is a brute fact (2004, p78). Swinburne gives us an example of winning at roulette. There's no reason for the winning other than that the roulette wheel happened to stop on the winning number; the explanation is *complete* (p79). God, for Swinburne, is an explanation of this sort. Lastly, there is an *absolute* explanation. This is an *ultimate* explanation in which the first causal factor is logically necessary or self-explanatory (2004, p79). “There are no brute facts in absolute explanations — here everything really is explained.” (ibid.). Swinburne is quite clear, however, that on his theology, God is *not* an absolute explanation:

“... it seems coherent to suppose that there exists a complex physical universe but no God, from which it follows that it is coherent to suppose that there exists no God, from

⁸ Oppenheimer, P. E., & Zalta, E. N (2011). A Computationally-Discovered Simplification of the Ontological Argument. *Australasian Journal of Philosophy*, 89(2), 333 - 349.

⁹ *Critique*, A592/B620, p411

¹⁰ Grier, M (2012). “Kant's Critique of Metaphysics”. *Stanford Encyclopedia of Philosophy*. <http://plato.stanford.edu/entries/kant-metaphysics/#OntArg>. Accessed 30 Mar 2013.

which in turn it follows that God is not a logically necessary being. There can be no ‘absolute explanation’ of the existence of the universe.” (2004, p148, cf. p79).

He then says in the footnote on the same page:

“If this is correct, then, of course, the traditional ontological argument, [...] which attempts to prove that God exists of logical necessity, fails utterly.”

Like all the other deductive arguments about God, the Ontological Argument has a large corpus of literature around it, and I will not be considering it further in this thesis. Instead, I will on occasion just indicate why Swinburne needs it (despite rejecting it), and will simply assume that the reader is familiar with it. But let’s leave it there.

I will now make a brief mention of the deductive argument from the problem of evil, mostly for completeness, not because I find it particularly strong; instead, this just serves to show why we reject it. The deductive argument from evil claims that it is incoherent to believe in God and acknowledge the existence of evil. For were God all-powerful, he could stop any evil, were he omniscient, he would know of all evils, and were he omnibenevolent, he would want to stop all evils. Thus, since God knows about, is able to, and wants to stop all evils, evils should not exist if God exists (Mackie, 1955, p200; 1982, p150). As plausible as this argument sounds, *prima facie*, it fails, for well-known reasons which are given by Plantinga. Plantinga argues that God might not be able to “properly eliminate” evil (Plantinga in Peterson et al., 1996, p261). That is, evils that still exist, are those evils which cannot be eliminated without God introducing a worse evil. Therefore, it is possible to describe scenarios in which the existence of evil is, in a way, compatible with God’s benevolence.¹¹ We will discuss the problem of evil in more detail in Chapter 11.

However, to repeat, I will generally avoid further deductive arguments, and will generally stick to probabilistic or inductive arguments (evidential arguments). I will likewise not be considering the broader issue of the *coherence of theism* (even though Swinburne has dedicated an entire book to the matter, of the same title), due to reasons of space, and due to my desire to focus on evidential and inductive arguments.

Why Cosmology

Not only will I generally exclude deductive arguments, then, but I will also make limited to no use of certain evidence-based arguments; such as Teleology (that the universe was

¹¹ Plantinga in Peterson et al. p256 et seq.; Pargetter, 1976, pp243-4; Martin, 1978, p432

designed for a purpose: human life); Consciousness (that we have these inexplicable mental states); Morality (that we have ethics); Providence (that God seems to provide for us to prosper, and for life in general); Miracles (that events occur sometimes which seem to violate the laws of science, q.v. Swinburne, 2004, p18; p326); and lastly, Religious Experience (that people have spiritual experiences).

Some of these arguments are indeed worth considering. Plantinga, for example, in Plantinga and Tooley (2008) argues that consciousness is inexplicable in science, due to scientific explanations never capturing the first-person subjectivity of the Nagelian ‘what it is like’ to have a mental state.¹² Thus, Plantinga concludes, we are irreducibly spiritual. The discussion in Plantinga and Tooley can be referred to by the interested reader; however, by way of a brief response, it seems apparent that consciousness is located in the brain, due to the wealth of scientific evidence that we have to that effect, and so, it seems to be a physical phenomenon, albeit unsatisfactorily explained. Again, for reasons of space, we cannot enter this debate, even though it might have some attractions.

That aside, I consider most of the other evidential arguments to be weak, and therefore do not address them in detail. Let me digress briefly to explain why.

Let’s start with the claim that morality comes from God. Of course, there is the Euthyphro Dilemma in Plato’s work of the same name: “Is the pious loved by the gods because it is pious, or is it pious because it is loved by the gods?” — that is, either some action A is good because it just is good, (and God telling us to perform that A is good because he said we must perform it, is irrelevant), or, A is only good because God told us to perform it? — in which case A’s being good is completely arbitrary or discretionary). If we consider these arguments, we can see that it’s unclear, that morality comes from religion. We may, instead, have just evolved to be moral. So, for example, apes exhibit moral behaviours such as fairness.¹³ As such, if we evolved from apes, it would be expected that we’d also show moral behaviours without a need for religious texts with morally dubious edicts.¹⁴ Indeed, Richard Holloway, for example, himself a clergyman, spends an entire book (2004) arguing that it’s possible to be moral without God.

Now let us briefly consider the arguments from miracles and/or religious experience:

- (1) x (a putative miracle or religious experience) cannot be explained with existing sciences

¹² cf. Nagel, 1974.

¹³ Brosnan and de Waal (2003); Warneken (2006); de Boer (2011); Proctor, Williamson, de Waal, and Brosnan (2013).

¹⁴ Some religious texts contain edicts which we’d now reject. Q.v. Deuteronomy 21:18-21; Ezekiel 5:10 and 6:5; Hosea 13:16; Isaiah 9:19-20 and 13:15-18; Jeremiah 19:9 and 25:33; Lamentations 2:20 and 4:10; Leviticus 26:27-29; Micah 3:2-4; Proverbs 22:15 and 23:13; Psalms 137:9; Zechariah 11:9, to list just a few.

- (2) The simplest/best hypothesis to explain x is theism
- (3) Therefore x is evidence for theism
- (4) Therefore, the probability of theism is increased, given x (Swinburne, 2004, pp326-7).

This is clearly an inductive argument. However, in considering the argument above, for most cases, x has turned out to really take a scientific explanation, or, x was documented before the invention of cameras, and so the legitimacy of the record of experiencing of x is suspect. Therefore, a skeptic will find it hard to accept premise (1); indeed, (1) may even be question-begging. Unless a theist can establish that x is *only* to be explained by reference to the supernatural, there is no compelling reason to accept (1). If the reader accepts my points thus far, then, we're left with the arguments from teleology and cosmology.

By contrast to the evidential arguments provided by the theist thus far, a large portion of Swinburne's book is dedicated to the cosmological and teleological arguments.¹⁵ In the case of teleology, Swinburne specifically bases his argument on cosmology rather than biology. That is, Swinburne does not speak to the argument from "Intelligent Design". Instead, Swinburne argues that since this universe is likely to exist, given God (the cosmological argument), the universe must exist *so as* to enable God's end purposes (*telos*), namely, life support (the teleological argument). So for our purposes, we may treat these arguments as essentially the same (or that one elides into the other). In both cases, God is invoked to explain why we have a universe like ours.

Therefore, it seems more important to say why the cosmological argument is, in my view, the most plausible evidential argument for theism, and, were it as plausible as Swinburne believes, that in fact the cosmological argument alone would suffice as an argument giving strong (confirmatory) support to theism. Consider the following premise:

(1*) e [our life-capable universe] is highly unlikely to exist given what we know about conditions at the beginning of the universe.

Since (1*) is a point of agreement between most theists, physicalists and some atheists, it seems that the argument above, (1-4), is strong for the case of e , the evidence of our life-capable universe.¹⁶ Therefore, the key argument for an atheist to address, is in fact the

¹⁵ Up to page 192 out of 343. If we count his preamble about science and how theism leads us to expect a universe like this one, over half of Swinburne's 2004 book discusses science, scientific explanation, and cosmology.

¹⁶ However, it is worth pointing out that Stenger and Vilenkin disagree. Their views are discussed in Chapter 9.

cosmological argument: would God create a universe like this one? Or, is this universe evidence for God?

We will see in the next chapter that Swinburne distinguishes between what he calls a P-inductive argument and what he calls a C-inductive argument. In brief, a P-inductive argument is one in which the evidence supports the hypothesis such that after considering the evidence, the hypothesis is more than 50:50 likely. Whereas, a C-inductive argument merely supports the hypothesis, but does not guarantee its probability will be as high as 50:50; the hypothesis is just *more likely*, after considering evidence, than before.

Swinburne's goal in his 2004 book is to collate all these arguments listed above (miracles, revelation, providence, consciousness, cosmology, teleology, ethics), to create a P-inductive argument for God. Yet it is my view that these other arguments are so weak that they do not significantly increase the probability of the hypothesis of theism after considering the evidence that they offer, since the atheist or physicalist will not accept the premises (that there are such things as miracles, revelations, providence; that ethics can only be supported by theism; that consciousness requires supernaturalism, etc.). It is my view, instead, that if there is to be a viable P-inductive argument (which strongly supports theism), then it will have to rest on the cosmological argument, since that is the one argument which an atheist might be persuaded by, given that it is the only theistic argument whose premise many atheists accept. And this is why this thesis mostly addresses the cosmological argument, so as to present the strongest evidential case for theism.

This thesis will, however, also address the evidential problem of evil. The reason is the same as the case of the cosmological argument: the theist and atheist agree on the basic premise. We might call this premise (1**), that *there is a lot of evil in this world, and some of it seems utterly pointless*. Thus, the atheist can construct a similar argument:

- (1**) There is a lot of evil in this world, and some of it seems utterly pointless.
- (2) The simplest/best hypothesis to explain evil is atheism: God does not exist.
- (3) Therefore evil is evidence for atheism
- (4) Therefore, atheism is more probable, given evil.¹⁷

This argument will be spelt out in more detail in Chapter 11.

¹⁷ The above argument is deliberately ambiguous between claiming that the evidence increases the probability of atheism and claiming that it makes it more probable than not. (In language we will develop below, it is ambiguous between a P and C-inductive argument.) We shall clarify precisely how the chapter ought to be understood in 11.

Structure of the Thesis

As a broad structure, we will be focusing on Bayes' Theorem and how Swinburne uses it to support his version of the cosmological argument, i.e. that our universe is evidence for the existence of God, since a benevolent God would likely create an ordered universe such as ours. The problem of evil will mostly be used to contest the cosmological argument, that is, to show why God would *not* create a universe such as ours. The thesis will therefore make, or has thus far made, the following arguments in approximately the following order:

1. The most compelling argument for theism is the cosmological argument.
2. The thesis will then present Swinburne's arguments to the effect that:
 - 2.1. This universe's structure and life-supporting capacity is improbable (Swinburne, 2004, p49, p150), given the stringent "finely-tuned" requirements for life (Leslie, 2000, p12), and the Second Law of Thermodynamics (Giancoli, 1990, p396). In other words, the probability of the existence of this kind of life-capable universe is low;
 - 2.2. This universe's structure and life-supporting capacity is evidence for theism; that is, the probability of this universe existing is greater on the hypothesis of theism than the hypothesis of physicalism, and
 - 2.3. A theistic explanation for the universe is more probable because theism is simpler (Swinburne, 2004, p98).
3. The three arguments above each represent a component of the basic structure of Bayes' Theorem, which we won't discuss just yet or symbolise just yet. We will look at Swinburne's cosmological argument, from a Bayesian perspective, first by explaining what Bayes' Theorem is.
4. We then start to identify problems for Swinburne's argument:
 - 4.1. Firstly, we need to be able to fix (get a value for) the prior probability of theism, that is, how probable theism is prior to any considerations of evidence.
 - 4.2. We will argue that we can do this in a scientific context for an hypothesis with objective measurables, but not in a theistic context. That is, we'll claim that we can't fix the prior probabilities ("priors").
 - 4.3. We'll see that Swinburne claims that we can fix the priors with the concept of simplicity.
5. We then consider some arguments against the claim that we can fix the priors with the concept of simplicity.
6. Once we determine that simplicity isn't a way to fix the priors, we'll see that this undermines P-inductive arguments, in particular, the cosmological argument. We

consider an argument from Gwiazda and show, for mathematical reasons, why it seems that we cannot get a P-inductive argument for theism.

7. Then we consider whether God is a good (enough) explanation for our universe, even if God is not simple. That is, we consider whether the evidence, the existence of this universe has a high probability, given theism.
8. We find that there is no good reason to say that theism explains the universe better than competing theories, specifically physicalism; that is, its likelihood is not high, and at least is not higher than physicalism.
9. We therefore conclude that there is no C-inductive argument from cosmology to theism, because of the likelihoods. Thus, if there is no P- or C-inductive argument for theism from cosmological evidence, the cosmological argument fails.
10. We then turn to the problem of evil. Without relying on prior probabilities of atheism and entering the Bayesian problems raised for theism, one way to object to theism is to point out the possible existence of Gratuitous Evils (evils which seem utterly pointless).
11. The most plausible theistic response to Gratuitous Evil is Skeptical Theism, that is, that we are unable to know God's intentions. But that stance undermines the cosmological argument, since we need to know God's intentions to explain the existence of the universe using theism.
12. We then conclude that, given that the cosmological argument is the most compelling evidential argument for theism, and that it fails, we see that the theist can offer no strongly compelling evidential argument for theism, as we have already indicated in this Introduction that other such arguments for theism are poorer than the cosmological argument. Therefore, holding the fideist/voluntarist position, or the Hypothesis of Indifference (that God is not benevolent) are stronger stances, and perhaps these form the only rationally acceptable alternatives to atheism or agnosticism.

2. An Introduction to Bayesian Reasoning

“It is a capital mistake to theorise before you have all the evidence. It biases the judgment”.

— Sherlock Holmes, in A Study in Scarlet, by Arthur Conan Doyle, 1887.

Introduction: Scientific Confirmation and Evidence

This chapter will discuss and explain Bayesian confirmation theory, including Swinburne’s characterisation of the theory, and what he calls P-inductive and C-inductive arguments. The aim of the chapter will be to offer an account of the factors which determine whether a hypothesis is confirmed or not, as a prelude to our discussion of Swinburne’s Bayesian version of the cosmological argument.

Let’s start by considering how we use induction to support our beliefs. The more evidence one accrues around a particular hypothesis, the more it is supported. So, one white swan does not strongly support the hypothesis that all swans are white, however, observing hundreds of white swans, does. But there comes a point where eventually more new evidence of the same kind becomes moot. That is, eventually, seeing further white swans does not significantly improve our belief in the hypothesis that swans are white. Thus, our accepting a theory depends on the accumulation of evidence.

Now, our degrees of belief in a hypothesis can be represented as a probability. For example, when we can say that we believe that a specific horse will win a race with certain odds, that means that we’re implicitly assigning a numeric probability value to the proposition that the horse will win. But our degrees of belief in a proposition (or hypothesis) are not unrestricted, that is, we cannot assign any arbitrary value. Our degrees of belief in a hypothesis must adhere to the following basic rules of the probability calculus. These rules are as follows. For any events or phenomena X or Y in set S (cf. Hájek, 2009b, p175):

- i) Nonnegativity: $P(X) \geq 0$ for all X in S.
- ii) Normalization: $P(T) = 1$ for any tautology T in S.
- iii) Finite additivity: $P(X \vee Y) = P(X) + P(Y)$ for all X, Y in S such that X and Y are mutually exclusive. Coupled with (i) and (ii) above, (iii) entails that $P(X \vee \sim X)$ and $P(X) + P(\sim X) = 1.0$, if $(X \ \& \ \sim X)$ exhausts the range of possibilities.

To interpret this terse symbolism: (i) means that probability values cannot go below zero; (ii) means that anything that is necessarily true has a probability of 1.0 (certain); and (iii) means that if either X or Y are true, then the probability that (X or Y) is true, is obtained by adding their individual probability values, but only if X and Y are incompatible, e.g. where $Y \supset \sim X$.

What is Bayes' Theorem?

Bayes' Theorem is a formula for the updating of our degrees of belief in a theory (or hypothesis), given our prior estimates of its probability and the various factors in our background knowledge, which may influence the values we allocate to the prior estimates of a hypothesis' probability. In plainer English, Bayes' Theorem tells us what the probability of a hypothesis is going to be, if we know: (a) how probable it is, that the evidence we've seen would occur, and, (b) how probable our theory is (without considering evidence), but only if we also know (c) how probable the evidence is, given our theory. Probabilities in the Bayesian framework are *personal* probabilities; they represent rational credences; that is, to what extent we believe in or accept hypotheses (given the evidence).

Bayes' Theorem is derivable from the axioms of probability and the considerations given above. So, if we refer to (a), (b), (c) above, we take it that (a) how probable it is, that the evidence *e* that we've seen would occur, can be written as $P(e)$. This is sometimes referred to as the *expectedness* of the evidence. Then (b), or how probable our theory is (without considering evidence), is written as $P(h)$. This is referred to as the "prior probability" of the hypothesis. And lastly (c), how probable the evidence is, given our theory, is written $P(e|h)$. This is known, somewhat confusingly, as the *likelihood*.¹⁸ We express Bayes' Theorem as follows:

$$P(h|e) = \frac{P(e|h) \times P(h)}{P(e)}$$

This reads: The probability of the hypothesis *h*, given the evidence *e* ($P(h|e)$) is equal to: The probability of the evidence given the hypothesis ($P(e|h)$), multiplied by the prior probability ($P(h)$) of the hypothesis (how probable we think it is before the evidence is in), and divided by the prior probability of the evidence ($P(e)$). The derivation is given in Hacking (2001, p70), for which see the footnote.¹⁹

¹⁸ 'Likelihood' is formally different to 'probability,' although in common English usage, they mean the same. *Likelihood* is an indication of our trust in the *model* that we have, rather than an indication of how *probable* the *outcomes* are. So, $P(h|e)$, the posterior, indicates how probable the theory is given the evidence; whereas the likelihood indicates how expected the evidence is, given the theory. So, if we think a coin is unfair or loaded, given it consistently turning heads, that is $P(h|e)$. However, how often we expect to see heads (*e*) given a fair coin (*h*), is $P(e|h)$, the likelihood that the coin is fair. Formally, the likelihood function *L* is defined as $L(h|e) = P(e|h)$; that is, the likelihood of *h* given *e*, is equal to the probability of *e* given *h*. $L(h|e)$ is not equal to $P(h|e)$ since $L(h|e) = P(e|h) \neq P(h|e)$.

¹⁹ $P(h \& e) = P(e \& h)$
 $P(h \& e) \times P(e) / P(e) = P(e \& h) \times P(h) / P(h)$

To get some intuitive idea of how Bayes' Theorem is supposed to model the updating of our beliefs in light of new evidence, consider the case where we hear an 'unlikely story', h , some anecdote that we find hard to believe. This means that we disbelieve, or assign a low probability to the truth of h . But we can also adjust our beliefs according to changing evidence. So, suppose that after hearing the unlikely story h , we are presented with a photograph which seems to show that h is true. We would tend to accept that photograph as evidence e , and consider h to be more likely than not; that is, h would be assigned a higher probability after viewing the evidence.

This is just what this interpretation of Bayes' Theorem does, but in a precise quantitative fashion. It tells us how to update the probabilities that we'd assign to our beliefs after viewing evidence. In effect, Bayes' Theorem compels us to adhere to the basic rules of the probability calculus;²⁰ because in using Bayes' Theorem, we're compelled to ensure that the final value calculated for a probability is in the range $[0;1]$ — (i), (ii) above — and that the various competing hypotheses are recognised (iii above), for example, that h might be false. As such, Bayes' Theorem represents a formalisation of inductive logic. But Bayes' Theorem doesn't only do that. It also models how or why we select particular scientific hypotheses. In Bayes' Theorem, we say that evidence e confirms hypothesis h , *iff* $P(h|e) > P(h)$; that is, if the hypothesis h is more probable (P), after being given the evidence (e), than h was, before considering e . We'll see more about this below when we get to an example.

Let's now think a little about $P(e|h)$, the 'likelihood.' The likelihood of h is not the probability of h , but rather the probability that h bestows upon e . The likelihood, $P(e|h)$, tells us how probable the evidence would be on the assumption that the hypothesis, h , is true. It is sometimes claimed to be a measure of explanatory power (Sober, 1994, p137).²¹ This means that a hypothesis that leads us to expect the evidence, in a sense, might be taken to be a good explanatory hypothesis.

Now, the version of Bayes' Theorem that Swinburne uses in his 2004 *The Existence of God* is slightly more complex than that version given above:

Using the definition of conditional probability,
 $P(h|e) \times P(e) = P(e|h) \times P(h)$
 therefore
 $P(h|e) = P(h) \times P(e|h) / P(e)$

²⁰ General arguments can be found for why our credences ought to conform to the probability calculus. See Hacking (2001) for example. The cogency of these arguments is disputed some by some (e.g., Howson, 2001), but since Swinburne accepts the general framework, such subtleties will not concern us here.

²¹ Sober says: "P(EIH) ... is often a plausible measure of explanatory power. If some hypothesis were true, how good an explanation would it provide of the evidence (E)?" (Sober, 1994, p137). We discuss the 'likelihood' in detail in Chapter 8.

$$P(h|e \& k) = \frac{P(e|h \& k) \times P(h|k)}{P(e|k)}$$

In this version of the theorem, we see that a term k is introduced. This k stands for ‘background knowledge.’ We will see that k is in fact crucial to deciding questions of hypothesis choice, and we discuss that in Chapter 5. For our purposes now, we can take it that k contains degrees of belief in relevant theories, formulae, and known data not under investigation in e .

Let’s take the simple case of swans’ colour again. Suppose my friend relates a hypothesis to me to the effect that “all swans are white”, h , and I have no strong opinion on the matter. Suppose I subsequently see two or three swans and they are white. This is evidence e . Suppose, now, I want to consider the probability of encountering swans in future, and I believe that they will always be white, given e and h . How do I work this out in Bayes’ Theorem?

Consider first $P(h)$; the prior probability. Let’s say I think on reflection it is as likely as not that all swans are white, so $P(h) = 0.5$. Now let’s think about the likelihood, $P(e|h)$. The probability that next swan we will encounter will be white, on the supposition that all swans are white is obviously 1; so $P(e|h) = 1$. Finally we must consider $P(e)$, the expectedness of the evidence. Where can we get a value for that? The answer is from the Total Probability Rule, which now follows.

The Total Probability Rule

To ensure that we get a probabilistically coherent value for $P(e)$, that is, within the range $[0;1]$, we need to introduce another rule of the probability calculus — what Hacking calls the Total Probability Rule (TPR).²² TPR is derived from the condition where two or more competing hypotheses exhaust the range of possibilities, in the simplest case, where either h is true or $\sim h$ is true ($h \vee \sim h$). For example, either swans are white, h , or they are not ($\sim h$). For the derivation of TPR, see the footnote.²³ TPR is stated in its simplest form, using our e and h as:

²² Hacking, 2001, p59, p70; 2008, pp69-70; also seen in Swinburne, 2004, p72, p339. We will make frequent reference to the TPR throughout this thesis, so the reader should be familiar with its structure.

²³ Compare Hacking, 2001, pp58-59:

If A and B are mutually exclusive, then

(i) $P(A \vee B) = P(A) + P(B)$

If $P(B) > 0$, then

(ii) $P(A|B) = P(A \& B)/P(B)$ so

(iii) $P(B) = P(A \& B)/P(A|B)$

Thus, substituting into (i), $P(A) = P(B) \times P(A|B) + P(\sim B) \times P(A|\sim B)$

$$P(e) = P(h) \times P(e|h) + P(\sim h) \times P(e|\sim h)$$

or, with k reintroduced,

$$P(ek) = P(h|k)P(e|h\&k) + P(\sim h|k)P(e|\sim h\&k).^{24}$$

This reads, in the simpler form: the probability of e is equal to the prior probability of h multiplied by the probability of e given h , added to the prior probability that h is false, multiplied by the probability of e , given that h is false. So, given that Bayes' Theorem is

$$P(h|e\&k) = \frac{P(e|h\&k) \times P(h|k)}{P(ek)}$$

we can replace $P(ek)$ with TPR yielding:

$$P(h|e\&k) = \frac{P(h|k) \times P(e|h\&k)}{P(h|k) \times P(e|h\&k) + P(\sim h|k) \times P(e|\sim h\&k)}$$

Let's now go back to our swan example. On the basis of TPR, we can now calculate a value for $P(e)$, if we supply a value for $P(e|\sim h)$. Let's say we think that *if* it is not true that all swans are white, that we think the chances of the next swan we see being white are 50:50. So $P(e|\sim h) = 0.5$. So from the TPR:

$$P(e) = 1 \times 0.5 + 0.5 \times 0.5 = 0.75$$

Plugging that into Bayes' Theorem, we get:

$$P(h|e) = 0.5/0.75 = 0.66$$

Hence we can see, as we would expect, that evidence e — the handful of white swans that we've seen so far — confirms the hypothesis that all swans are white, since 0.66, the calculated value for $P(h|e)$, is greater than 0.5, our original value for $P(h)$.²⁵

²⁴ See Hacking, p70 for this version.

²⁵ Naturally, the value would change to zero if we saw a black swan.

Reciprocal Support

Before we go onto another example, the reader should be familiar with another equation, which I will call Reciprocal Support, which is derived from Bayes' Theorem. The concept can be expressed as follows:

$$P(e|h \& k) > P(e|k) \text{ iff } P(h|e \& k) > P(h|k)$$

This tells us that evidence e , confirms h if and only if the likelihood of h is greater than the expectedness of e . It is elementary to derive this from Bayes' theorem

$$P(h|e) = P(h) \times P(e|h)/P(e) \quad [\text{Bayes' Theorem}]$$

$$P(h|e)/P(h) = P(e|h)/P(e)$$

$$\text{Therefore: } P(e|h) > P(e) \text{ iff } P(h|e) > P(h)$$

We shall see in later chapters this inequality plays an important role in some Bayesian arguments. What it means, to put it simply, is that if some evidence is expected on a certain hypothesis, then that hypothesis is more likely true given that evidence (and vice versa).

A scientific example

Let's turn now to a scientific case to enrich our understanding of how Bayes' Theorem can be used to understand confirmation. We will give the examples first, and, after explaining further mathematics, formalise the cases.

We start with the example of the perihelion of Mercury.²⁶ When the ellipsoid orbit of a planet changes the position of the origin that it orbits around, we call this "precession". That is, the perihelion, or closest point to the sun, shifts slowly over time. The easiest way to visualise this is to imagine a daisy, with the sun as the eye of the flower. The orbit of Mercury is each petal. As time goes by, and as it completes an orbit, the planet moves to a new petal, and then orbits the outer edge of the petal. This precession can be accounted for by Newton's equations for all planets — except Mercury. In other words, this phenomenon was not fully explained until Einstein's theory of General Relativity predicted it, by precisely the amount required: an additional 43 arc seconds per century from the precession which was calculated by Newton's equations. So, we might ask, what is the likelihood that Newton's equations are true, given that there's a difference of 43 arc seconds in its predictions from

²⁶ see e.g. Hafele (2011) and Vankov (2014)

observation? Then, comparatively, what is the likelihood that Einstein's theory is correct, given that it predicts the precession correctly? As the reader can see, the example is of a theory which seems improbable at first blush (Relativity), and therefore seems to have a lower prior probability, but which is in fact supported by evidence, and thus, after considering evidence, has a higher posterior probability.

Another example of the success of General Relativity is the observation of light bending around a star. The phenomenon is observed when a star, located behind another star and at a distance from it, appears to move suddenly from one side of the foreground star to the other side. This would not be expected under Newtonian Mechanics, and yet it is predictable with General Relativity. So, again, given the evidence of light bending around stars, what is the probability that Newtonian mechanics is correct, or that General Relativity is correct?

Let's see what happens if we supply some numbers and put them into Bayes' Theorem. Let's return to the Perihelion example. We take Newtonian Mechanics as NM and General Relativity as GR. We are trying to assess the posterior probability of GR. As evidence, we have e_1 and e_2 , the Perihelion of Mercury, and light bending around a star. Let's just use e_1 in this example. Since GR predicts e_1 , it follows that $P(e_1|GR)$ is close to or equal to 1.0, given appropriate background beliefs²⁷ and the formulae that Einstein derived. Suppose, however, that the prior $P(GR)$ is relatively low, say 0.15, because GR is hard to believe and NM is so successful.

We start by calculating $P(e_1)$ on the basis of TPR, that is, with the general formula

$$P(e) = P(h) \times P(e|h) + P(\sim h) \times P(e|\sim h)$$

we substitute e_1 for e , and GR and $\sim GR$ for h and $\sim h$:

$$P(e_1) = P(GR) \times P(e_1|GR) + P(\sim GR) \times P(e_1|\sim GR)$$

Now, we've already said $P(e_1|GR)$ is close to 1.0, say 0.9, and we've said $P(GR) = 0.15$. It follows obviously that $P(\sim GR) = 0.85$, and yet suppose, however, that e_1 is very surprising on $\sim GR$, say 0.1. Taking these values, we obtain:

$$P(e_1) = 0.15 \times 0.9 + 0.85 \times 0.1$$

²⁷ Even though GR plus appropriate background knowledge entail this result, we are allowing that $P(e|GR)$ may be less than 1.0 because of some uncertainty in that background knowledge.

$$\begin{aligned}
&= 0.135 + 0.085 \\
&= 0.22
\end{aligned}$$

The prior probability for e_1 is therefore low. In other words, we'd not expect to see e_1 without GR. Now, substituting the value of $P(e_1)$ into Bayes' Theorem:

$$\begin{aligned}
P(\text{GR}|e_1) &= \frac{P(e_1|\text{GR}) \times P(\text{GR})}{P(e_1)} \\
&= (0.9 \times 0.15) / (0.22) \approx 0.61
\end{aligned}$$

This means that the evidence e_1 confirms GR, since, before the calculation, $P(\text{GR})$ was 0.15, and after the calculation, $P(\text{GR}|e_1) \approx 0.61$. It is worthwhile emphasising at this point just how surprising the evidence is. We certainly would not expect to see light bending around stars, or Mercury to have an anomalous precession. So the Theory of Relativity is all the more impressive, and hence confirmed, because e_1 and e_2 are surprising facts, and after calculation, we find that $P(h|e) \gg P(h)$.

P-inductive and C-inductive

When considering the probability of any particular hypothesis, we might consider multiple pieces of evidence. Swinburne, as we saw in the Introduction chapter, does just this. He offers a range of arguments, from cosmology and teleology, to miracles, and so on. These pieces of evidence, Swinburne argues, combine to produce strong support for theism (2004, p329, p341). Establishing an inductive argument which raises the probability of a hypothesis, then, does not by itself give us strong grounds to accept that hypothesis. So, Swinburne doesn't take it that just one argument — cosmology, say — is sufficient to raise the probability of theism to be greater than a half (that is, probably true). Instead, we need lots of evidence. Swinburne therefore introduces us to two kinds of inductive argument: *P-inductive* and *C-inductive* (2004, p6 et seq.).

A *P-inductive* argument is the case where $P(h|e) > 0.5$ — i.e., where the premises raise the probability over 0.5 so that the conclusion is more likely true than not (Swinburne, 2004, p17). A *C-inductive* argument, by contrast, is one which raises the posterior probability of a hypothesis, given the evidence supplied, but does not guarantee that the hypothesis will have a posterior probability over 0.5.

A combination of several good C-inductive arguments, however, might lead to a good P-inductive argument. So in the case of, say, the evidence for GR, the combination of C-

inductive arguments from e_1 (perihelion of Mercury) and e_2 (light bending) would lead to a P-inductive argument that GR is likely true, assuming the values we have supplied for the likelihoods and the priors are correct. So in the case of theism, the way Swinburne uses this distinction, as we mentioned, is that he has a number of weaker arguments (miracles, consciousness, morality, etc.), which are, in his terminology, C-inductive arguments, and he combines them ultimately in his final chapter to make one P-inductive argument (2004, p329, p341).

But that way of thinking about things is a little misleading, since it suggests that what is necessary turn a C-inductive to a P-inductive argument is just more and more evidence. But that's not quite right. Even if we have quite a lot of very good evidence, that will not guarantee that the hypothesis under investigation is probably true, as a well-known fallacy illustrates.

The Base Rate Fallacy

Consider the following example. Suppose that a reliable witness says that a hit-and-run accident involved a green taxi on a misty night. Suppose also that we know that taxi cabs (in New York, say) are mostly yellow. The consideration that the taxi was yellow, because yellow cabs just are more common, overpowers the probability of the taxi being green, even if the witness has in the past been reliable, because the sheer likelihood of the taxi being green is low. Failure to recognise this base rate (that taxis are usually yellow), leads us to erroneously favour the story that the witness is reliable, and that the taxi was green.²⁸

Let's take another more rigorous example. Suppose that the base rate of HIV-positive students is that 0.001, that is, for every 1000 students, 1 has HIV. Suppose that an over-the-counter test returns a positive result 95% of the time when the student is indeed HIV positive, while it gives a negative result 99% of the time when the student is not HIV-positive. Suppose further that a student goes for a medical test and the test reports that he is HIV-positive. Assume, further, that we know nothing more about this student, e.g. whether he's a high-risk case. What are the odds that he is in fact HIV-positive?

Most people will respond to this by saying, well, the test is wrong 5% of the time, so it's probably right 95% of the time, meaning that the odds are 95% or 0.95 that he is in fact HIV-positive. However, the actual answer is about 2%, because the false-positive rate is important, as are whether the individuals concerned actually are high-risk cases.

²⁸ Adapted from Hacking, 2008, p136

Let's see how we get this answer. Take e_t as the “the evidence that test indicated HIV”, and h_{HIV} as “the hypothesis that the person is in fact HIV-positive”. Bayes' Theorem becomes:

$$P(h_{HIV}|e_t) = \frac{P(e_t|h_{HIV}) P(h_{HIV})}{P(e_t)}$$

Now, we're given the base rate of 1/1000. So the prior probability $P(h_{HIV})$ is 0.001. We can make the calculation using Bayes's theorem, as follows.

$$\begin{array}{lll} P(e_t|h_{HIV}) & = 0.95 & \text{[given]} \\ P(e_t|\sim h_{HIV}) & = 1 - 0.95 (\sim e_t|\sim h_{HIV}) = 0.05 & \text{[given]} \\ P(h_{HIV}) & = 0.001 & \text{[given]} \\ P(\sim h_{HIV}) & = 0.999 & \text{[calculated]} \end{array}$$

To calculate $P(e_t)$, the prior probability of e_t , we use the Total Probability Rule, TPR.

$$\begin{aligned} P(e_t) &= P(e_t|h_{HIV}) P(h_{HIV}) + P(e_t|\sim h_{HIV}) P(\sim h_{HIV}) \\ &= (0.95)(0.001) + (0.05)(0.999) \\ &= 0.00095 + 0.04995 \\ &= 0.0509 \end{aligned}$$

$$P(h_{HIV}|e_t) = \frac{P(e_t|h_{HIV}) P(h_{HIV})}{P(e_t)}$$

$$P(h_{HIV}|e_t) = \frac{(0.95)(0.001)}{0.0509} = 0.018 \approx 2\%$$

However, using a above flow diagram given in Figure 1 can make the correct answer seem less mysterious. On average, amongst 1000 students tested, only 1 will have the disease. But if the other 999 are tested, we would expect about 50 of them to return a false positive. Hence, roughly 51 students would have a positive result, but only 1 of them would in fact be HIV positive. So the chances that student is HIV positive, given the test result is only in fact about 1/51 or roughly 2%.

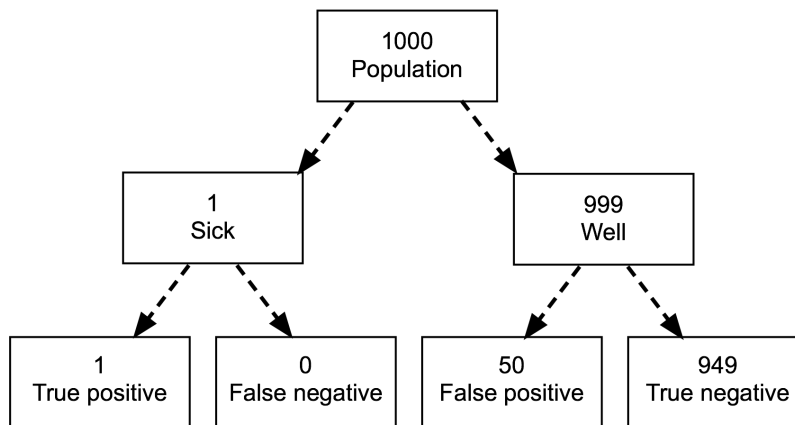


Figure 1. Probability of disease

This is a very simple but very important fact to understand. Even if we have apparently very good evidence, in Bayesian terminology, a very high likelihood, e.g. $P(e|h) = 0.95$ in this case, that does not all by itself make h probable.

As we see, the actual posterior probability is 0.018. To think that a high likelihood entails a high posterior, is to commit the base rate fallacy.

The effect of the base rate on Swinburne's P/C-inductive arguments

The base rate fallacy has important implications for the hypothesis of the theist. As we mentioned, Swinburne claims to be using a number of C-inductive arguments, such as the arguments from *teleology*, *cosmology*, *miracles*, *consciousness*, and so on, to build a case for an overall P-inductive argument to show that the probability of theism is greater than 0.5 (Swinburne, 2004, p329, 341).

But showing that these separate arguments are good (that is, that $P(e|h)$ is high) is not enough to ensure we have a good P-inductive argument. To do that, as the base rate fallacy shows, we need to fix a value for the prior $P(h)$, too. This is important because, even if you agree with Swinburne that the cosmological argument all by itself does not constitute a P-inductive argument, it allows us to draw an important general conclusion about the prospects for any P-inductive argument: unless there is a way to fix the value of $P(h)$, then there can be no P-inductive argument for theism. We'll see more about this in Chapter 7.

Turning now to C-inductive arguments, we can see that to establish $P(h|e) > P(h)$, we need only show that $P(e|h)/P(e)$ is greater than 1.0. In the simple case we are considering, comparing hypotheses h and $\sim h$, it follows immediately that this condition is only satisfied if $P(e|h) > P(e|\sim h)$, that is, if the hypothesis (theism) explains the evidence (our universe) better than competing hypotheses.²⁹

The above discussion allows us to translate Swinburne's claims about of C- and P-inductive arguments into a more rigorous Bayesian terminology, and so make it clear to us

²⁹ To spell it out: if $P(h|e) > P(h)$, then $P(\sim h|e) < P(\sim h)$ (if evidence e confirms h , it must disconfirm $\sim h$). So $P(e|h)/P(e) > P(e|\sim h)/P(e)$. So $P(e|h) > P(e|\sim h)$.

exactly what a theist must establish in order to claim he has provided a successful C- or P-inductive argument. Take C-inductive arguments first. To establish a good C-inductive it must be shown that:

$$P(elh) > P(el\sim h)$$

That is, that the evidence is more likely given the hypothesis, than if the hypothesis is false. Call this *the C-Inductive Threshold Inequality (CITI)*. Now, by contrast, to establish a good P-inductive argument it must be shown that $P(h|e) > P(\sim h|e)$:

$$P(elh) \times P(h)/P(e) > P(el\sim h) \times P(\sim h)/P(e)$$

Which simplifies to:

$$P(elh) \times P(h) > P(el\sim h) \times P(\sim h),$$

in other words, we can get a P-inductive argument $P(h|e) > P(\sim h|e)$ iff $P(h) \times P(elh) > P(\sim h) \times P(el\sim h)$. Call this *the P-inductive Threshold Inequality (PITI)*. So a good C-inductive cosmological argument will show that our universe is more probable given God exists, than he does not, and a good P-inductive argument will further establish values for $P(h)$ and $P(\sim h)$ which satisfy the above inequality.

In order to assess these arguments, then, what we need then are ways to fix the values for $P(h)$, $P(\sim h)$, $P(elh)$ and $P(el\sim h)$. But how do we do this? Reflecting on the examples I gave above, the reader may have the feeling that values I gave for these expressions in the swans and General Relativity case were plucked out of thin air; and that's because they *were*. That is not good for a theist like Swinburne (who, incidentally, seldom commits to actual values). Objective ways of fixing these probabilities, that all parties to the debate could reasonably agree upon, are required. We will see in the next chapter, where these issues are spelt out in more detail, how one might get values for $P(h)$, $P(e)$, and $P(elh)$ in certain contexts. We may note here, however, that it is unclear, *prima facie*, what value we should give to the prior probability of theism ($P(h)$), or the prior probability of the universe existing and being life-capable ($P(e)$). But without some way to do this, a Bayesian argument for theism can't even get off the ground, since we need to justify the values given.

3. The Problem of the Priors

Introduction

We saw in the previous chapter that without an objective way to set the prior probabilities of a hypothesis, we cannot get a Bayesian argument off the ground. Now, Swinburne, as we will see in Chapter 4, argues that theism is the simplest explanation for our universe *e*, and that the prior probability of theism is high, because simpler theories are more probable *a priori* (Swinburne, 2004, p53, p67, pp108-9; 2001, p82; 1997, p56). Swinburne tells us:

“The prior probability of a theory is its probability before we consider the detailed evidence of observation cited in its support. The *prior* probability of a theory depends on the degree of its *fit* with background knowledge (an *a posteriori* matter), and on its *simplicity* and *scope* (features internal to the theory and so an *a priori* matter).” (sic, 2004, p53, my emphases).³⁰

Furthermore, Swinburne tells us, theism and physicalism *both* try to explain the contingent (physical) world (p65). And theism and physicalism have the *same* “vast scope” (p72). Thus, Swinburne argues:

“The prior probability $P(h|k)$ is what I shall call the intrinsic probability of *h*, and will depend mainly on the simplicity of *h*” (2004, p67).

It is important that the reader note the above citation, as this is one of Swinburne’s key claims. Swinburne, indeed, builds much of his argument on this claim. In this chapter, we will investigate the ways that the prior probability of a hypothesis may be objectively fixed. In later chapters we shall pay special attention to the claim that *simpler* hypotheses are *a priori* more probable and whether theism is in fact simple. Here, though, our goal is to show that alternative ways, common in certain scientific contexts, of fixing the priors, are unavailable to the theist. This is either because these other ways of fixing the priors involve conditions that will not hold in the cosmological setting, or, they would set the priors so low, that it would be impossible to use them as a basis for an effective P-inductive argument. In effect, we shall show that the only way Swinburne could hope to fix the priors to make his cosmological argument work is by an appeal to something like simplicity.

³⁰ The same position is articulated almost verbatim on 2004, p65.

The Priors and Subjectivity

The prior probability of hypothesis h can be written $P(h)$.³¹ In order to select a value for $P(h)$, we need to decide what factors could determine its value. A common charge against Bayesians is that the priors are not objective (Sober, 1994, pp138-9). This is most pronounced in cases where empirical data do not inform the hypothesis or a value for $P(e)$, and where the $P(h)$ value is subjective. Dawkins, for example, cites a Bayesian argument for God (this time made by Unwin). Dawkins comments:

“the GIGO principle (Garbage In, Garbage Out) is applicable here... The trouble is, the [...] weightings are not *measured* quantities but simply Stephen Unwin's own *personal* judgments, turned into numbers for the sake of the exercise.” (2006, p106, my italics).³²

Let's return to the example from General Relativity which we mentioned in Chapter 2, to get some feel for the problem. Suppose we consider the prior probability of General Relativity, to be $P(\text{GR}) = 0.1$, because we find it to be unbelievable again, e.g. that time can distort. Let's use the values from Chapter 2 with just this change. We start by calculating $P(e_1)$ on the basis of TPR:

$$P(e_1) = P(\text{GR}) \times P(e_1|\text{GR}) + P(\sim\text{GR}) \times P(e_1|\sim\text{GR})$$

Now, we've already said in the previous chapter that we'd work with $P(e_1|\text{GR})$ close to 1.0, say 0.9, and we've said $P(\text{GR}) = 0.1$, slightly lower than the last version of 0.15. It follows that $P(\sim\text{GR})$ must be 0.9, and yet suppose, however, that e_1 is very surprising on $\sim\text{GR}$, say also 0.1. Taking these values, we obtain:

$$P(e_1) = 0.1 \times 0.9 + 0.9 \times 0.1 = 0.18$$

The probability for e_1 is therefore low. In other words, we'd not expect to see e_1 without GR. Now, substituting the value of $P(e_1)$ into Bayes' Theorem:

³¹ In this chapter I will often omit “&k” for the sake of readability, but also because in some cases the discussion is around whether the priors depend on k; hence, they're sometimes stated without the k quite deliberately. Swinburne may believe, in the theistic context, that $P(h)$ is ‘pure’, in a sense of not dependent on background credences. He indicates as much on 2004, p67. However, the argument of Chapter 5 will be that *there's no such thing* as a hypothesis which doesn't depend on the epistemic context, k.

³² Gwiazda, 2009, pp361-363, and Stenger, 2011, p252, concur.

$$P(\text{GR}|e_1) = \frac{P(e_1|\text{GR}) \times P(\text{GR})}{P(e_1)} = (0.9 \times 0.1) / (0.18) = 0.5$$

This means that the evidence e_1 confirms GR, since, before the calculation, $P(\text{GR})$ was 0.15, and after the calculation, $P(\text{GR}|e_1) = 0.5$. But, if we're skeptical about General Relativity, we see that even good evidence, such as the light bending case, makes $P(\text{h}|e) = 0.5$. So what this shows, surprisingly, is that we haven't found strong P-inductive evidence. Suppose, now, we've decided that the odds are 1:100 that General Relativity is true, *a priori*, because we strongly disbelieve it. The result will be that the posterior is even more improbable:

$$P(e_1) = 0.01 \times 0.9 + 0.99 \times 0.1 = 0.108$$

$$P(\text{GR}|e_1) = \frac{P(e_1|\text{GR}) \times P(\text{GR})}{P(e_1)} = (0.9 \times 0.01) / (0.108) \approx 0.083$$

Despite the good evidence supporting the hypothesis, the posterior probability is very low, way below the P-inductive threshold of 0.5. So, as we can see from this demonstration, arbitrarily setting the value of the priors can drastically affect how plausible a hypothesis is taken to be, despite good evidence. Hence, it is important not just to fix the priors, but to get objective values for them, as well as for the other quantities.

Ways of setting priors: Appeal to empirical frequencies

In many contexts we can appeal to empirical frequencies in order to settle priors; for example, disease base rates, that is, how often a certain disease occurs in a population, in assessing the likelihood that an individual has that disease. So, for example, the base rate of HIV in South African females aged 15-49 is 0.1899, or about one in five; so, in this case, $P(\text{h}_{\text{HIV}}) = 0.1899$.³³ Obviously such information comes from sampling the relevant population. But in the case of theism, no such sampling is possible.

But without such empirically grounded base rates, the question then arises of where we are to get our priors from? There are essentially two strategies available. Either (a) we can adopt a form of Objective Bayesianism, in which we appealed to additional *a priori* factors, to fix the priors. (Swinburne's own use of simplicity can be seen as a version of Objective Bayesianism). Or (b) we could try to argue that the subjectivity of the priors is in some cases

³³ Statistics South Africa (2015). Statistical release P0302: Mid-year population estimates. <https://www.statssa.gov.za/publications/P0302/P03022015.pdf> — Accessed Dec 2, 2016.

epistemically unimportant, since these priors “wash away” as evidence accumulates. We’ll discuss both of these options below.

Objective Bayesianism: The principle of indifference — What is it?

Before we can discuss contemporary forms of Objective Bayesianism, we need to introduce the oldest objective Bayesian principle, the so-called Principle of Indifference. This principle says that, given a set of competing and mutually exclusive hypotheses about which we have no evidence and no *a priori* reasons to favour any particular one, we should assign each hypothesis the same prior probability. That is, for n competing and mutually exclusive hypotheses, any particular hypothesis h has the prior probability of $P(h) = 1/n$ (Kass and Wasserman, 1996, p1347). Recall the third law of the probability calculus, to wit: “Finite additivity: $P(X \vee Y) = P(X) + P(Y)$ for all X, Y in S such that X is incompatible with Y .” (Hájek, 2009b, p175). This means that any set of exclusive hypotheses, indeed, any probability measure, must add up to at most 1.0 and not be below zero. In short, the sum of an exhaustive list of mutually incompatible possibilities must add to one.

One way to fix an objective prior for theism, then, would be to identify the relevant “live” competing hypotheses, as mentioned earlier, and use the principle of indifference to set the priors. A “live” alternative would be one which we objectively should take seriously, which has a non-negligible probability. Of course, Swinburne does contemplate other hypotheses against theism, but he rejects them as more or less irrelevant. But it is unclear what objective reasons there would be for this. Even if we accept that polytheism is improbable, in agreement with Swinburne, there are other extant traditions which endorse pantheism, panentheism, deism, gnosticism, Taoism, and others, which are plausible competitors, in the sense that they all have strong traditions arguing for them. Moreover, it is easy to see how to tweak Restricted Theism to generate other alternatives. We could imagine a God who is omniscient but not omnipotent; a God who is very powerful but not all-powerful; a God who is all-powerful but evil; versions of Manichaeism; a God who knows a lot but not everything, and so on. Restricted Theism, then, is not the only hypothesis competing for the probability space with physicalism (and indeed, there may be different mutually exclusive kinds of atheism too). At the very least, it seems that there are a very large number of coherent rivals to theism, perhaps even an infinite number. Applying the principle of indifference, then the prior probability of theism would be very small indeed, perhaps infinitesimal. Clearly if $P(h)$ is virtually zero, it will be impossible to mount a compelling P-inductive argument without extraordinarily compelling evidence or evidence which is only compatible with theism.

Swinburne pre-empts this concern about the division of the probability space in his 2004 book, in a footnote, but he suggests that the probabilities need not be equal (that is, he rejects the principle of indifference):

“The claim that all universal scientific theories have zero probability on any evidence is in no way forced upon us... if one assumed that each of an infinite number of incompatible universal scientific theories had equal prior probability, one would have to conclude that the prior probability of each was zero, or infinitesimal. This is because ... the probability of a number of exclusive ... and exhaustive... alternatives must add up to 1. ... From that it follows, given the calculus, that the posterior probability of each theory, on any evidence at all, would also be 0 or infinitesimal ... *But there is no need to make the implausible assumption that each of such theories has the same prior probability.* ... And, an infinite number of prior probabilities, each of which has a finite value and which are not all equal to each other, can add up to 1. For example, the infinite series $1/2 + 1/4 + 1/8 + 1/16 \dots$ etc. adds up to 1.” (Swinburne, 2004, p332:n1) [My italics].

What Swinburne does highlight, then, is that the hypotheses, even if of an infinite number, *need not have equal priors, contra* the principle of indifference. And that may yet give him the elbow room that he needs for theism. So, if Swinburne can argue that theism has a large prior, even in the context of other hypotheses, he can escape from the problem that he’s sharing the probability space with other hypotheses. But it’s still unclear why we should assign competing hypotheses unequal priors, or give theism a higher prior. Let’s see if more contemporary versions of Objective Bayesianism can help him.

Contemporary accounts of Objective Bayesianism

The idea of Objective Bayesianism is to obtain rational degrees of belief which are independent of the agent concerned, in other words, “agent invariant” (Williamson 2005, pp11-12; cf. Bandopadhyay and Brittan, 2010, p50). So, for example, as we’ve already mentioned, in cases such as disease, the priors are simply the base rate probabilities of the disease incidence in the population (Sober, 1994, p138). The Objective Bayesian seeks a general procedure which will generate priors or at least an objective range of priors for all propositions.

The question for the theist, if Objective Bayesianism is plausible, is this. Given the same background knowledge k , which a theist and physicalist should both have, should the theist and physicalist both adopt the same $P(h|k)$? It seems that they must, because the facts

of the matter, k , should be objective if the assessment of $P(h)$ is in fact objective. So how do we establish these values?

Firstly, we need to strongly distinguish between *beliefs* and *evidence* if we are to hope for Objective Bayesianism. This is because we may argue that beliefs (in the propositional sense) are not always objective, where by contrast, empirical sensory evidence (belief) is generally objective. And so we should avoid using subjective beliefs, particularly propositional beliefs, as k or as evidential support for h (Bandopadhyay and Brittan, p59). In a scientific context, “I believe that e ” means something very similar to “I have evidence that e ”. Yet in religious contexts, beliefs are fundamentally non-evidential (cf. Van Leeuwen, 2014). We already made this point and discussed it in the Introduction, under the section about evidentialism, so we need not rehearse it here. The point is, that the type of belief we’re investigating has to be objective if the prior is to be objective. And yet if theism were objectively well-supported, there would be little dispute about it. Evidentialism demands that both the atheist and theist can make strong objective cases for their priors. And if the priors are fixed and objective, there can be no further dispute about the outputs of Bayes’ Theorem.

Now, in order for Objective Bayesianism to fix the priors relative to common background knowledge, as we said, we need to get a value for the lower and upper bounds of $P(h)$. To persuade two interlocutors who disagree — in this case, the theist and the atheist — the bounds of the probability of any theory, objectively, have to be based on data. If no data are available, the boundary of the probability space becomes subjective. Consider this example. What, Keynes asks, is the probability that I will send an unstamped letter? The lower bounds of the probability distribution is the objective, base rate that the post office reports that unstamped letters are received. The upper bounds of the base rate interval, however, depends on my own subjective opinion of how scatterbrained I am; and it is difficult to see how this could be objective (Bandopadhyay and Brittan, 2010, p57).

All of the above show how difficult the task is for the Objective Bayesian. But even supposing there were some general way to deal with cases like the one above, Objective Bayesianism can do little to help the theist. Modern forms of Objective Bayesianism differ from the Principle of Indifference in that they allow the priors for mutually exclusive rivals may differ; since they use more sophisticated principles; like the Principle of Maximum Entropy³⁴ to fix prior probabilities. Yet these ways of fixing the priors all make use of background knowledge and empirical data. It is the background knowledge, then, which will determine the correct probability distribution, according to Objective Bayesians. And we’ll discuss problems around background knowledge in Chapter 5, particularly around how it relates to $P(h)$. We’ll see that k is in fact important in assessing $P(h)$.

³⁴ That in the absence of knowledge, the probability distribution with the maximum entropy best represents the distribution of the priors. (Jaynes, 1988).

That being said, Swinburne nonetheless maintains that in the special context of the cosmological argument, we have no (non-tautological) background knowledge; “In consequence”, he says, “there will be no background knowledge with which [theism] has to fit.” (2004, p66).³⁵ And this seems the right thing to say, if we agree with Swinburne’s argument that every contingent fact (*k*) is supposed to *part of* what is explained by the cosmological argument. But this means, then, that we have to pretend *absolute ignorance* — there’s no background data. In that special case — that Objective Bayesians call “absolute ignorance” — however, these principles become equivalent to the principle of indifference. That is, without background knowledge to inform our values for $P(h)$, how are we to set its value except as a function of the principle of indifference? So, again, if Swinburne were to appeal to these sorts of procedures to fix the priors, he would again be left with a prior which is vanishingly small.

Convergence of the Priors, or “Washing away” the priors

Another way to solve the subjectivity of the priors, then, is to show that they converge over time on a correct value, after repeated observations. Brown³⁶ and Resnik (1987, p55) point out that if we keep performing experiments and getting enough evidence, eventually our posterior probabilities will settle on the right value. If this is the case, then the initial value of $P(h)$ doesn’t really matter, because over time, the weight of evidence will bring it up to its correct level statistically. But before we contemplate whether this solution can help us in the case of theism, let’s consider a mundane example.

If you and I are about to flip a coin and you guess that the probability of heads is 0.8, and I guess it’s 0.2, those would be our prior probabilities. But, over time, repeating the flip, if the coin is fair we will see most probably runs where the number of heads and tails are roughly equally. If we conditionalise on these events then our posterior probabilities will move more and more towards 0.5; in the limit it can be proved they will converge on this value. Our prior probabilities in this case would become ever more irrelevant as more evidence came in, and more trials documented (cf. Swinburne, 2001, p58). Prior probabilities may therefore not have any relevance in a long run of events of the same type. Conditionalise enough, then, and no matter where you start out, your degrees of belief or posterior probabilities will converge.

³⁵ Dawes (2009), pp128-31, rejects Swinburne’s claim about background knowledge (that there is no *k* where theism is concerned). Since the thesis is addressing Swinburne, we will take Swinburne’s view, even though we will indicate, later on, that this is unlikely to be the correct view.

³⁶ Brown, C. personal communication, 2009.

If we could adapt this strategy to theism, this might suggest that Swinburne's strong reliance on $P(h|k)$ being high, due to simplicity, is unnecessary, since "the truth will out". But there are certain special conditions, under which the convergence theorem will hold. For some of these conditions, it is doubtful whether they hold, and for at least one we can be sure it does not.

Firstly, for the convergence theorem to hold we have to agree on the values of the likelihoods, i.e. $P(e|h)$ and $P(e|\sim h)$ at least, to assess $P(e)$, due to the TPR equation. But it seems *prima facie* that theists and atheists won't agree on this. It seems on the face of it that, where e is our universe, and h is theism, that $P(e|h)$ will be much higher for theist than the atheist. Part of what Swinburne argues is that we have good objective reasons to think $P(e|h)$ is high (which we discuss in Chapter 8). If those arguments are good, then perhaps he could reasonably argue that this condition is in fact fulfilled. For now, we need merely note that unlike the case of tosses of a fair coin, it is at least unclear that such conditions are in fact fulfilled until we discuss the matter in more detail in Chapter 8.

The second special condition, under which convergence theorems hold, is that we have to decide whether any of the priors will get a zero or near-zero probability. We know that Swinburne thinks that polytheism is a candidate for this. However, neither a polytheist nor an atheist would agree on the theist's priors. Hence, the convergence theorem would be unlikely to hold in this case. We need some independent way of avoiding the kind of priors we get from the principle of indifference. For if the prior probability of theism is in the worst case infinitesimal, then we will not get convergence, even in an infinitely long run. So this proposal, to use convergence, could not solve the problem of the priors by itself. We need some way of motivating that the prior probability of theism is a real, non-zero number.³⁷

Finally, and perhaps most obviously, the convergence theorem only holds in a long run anyway. But in the case of the argument between the theist and the atheist, there is no such long run of evidence. Even if we were charitable to Swinburne and granted that all of the arguments he presents constitute evidence for theism (miracles, revelation, providence, consciousness, cosmology, teleology, ethics), that gives us at most seven arguments. Clearly that's not much, and we could not expect widely divergent priors to allow us to conditionalise on such a meagre convergent evidential base.³⁸ It does not appear, then, that a theist can appeal to convergence theorems to solve the problem of the priors.

³⁷ Infinitesimals are not reals.

³⁸ Perhaps the theist would hope that some kinds of evidence are of a type which allow an agent to conditionalise on many particular instances. Obviously the cosmological argument is not like this. There is only one instance of the universe, and so we could only conditionalise once. But maybe the argument for miracles is like this. Perhaps there are a lot of miracles, which each constitute individual bits of evidence. While in theory this looks more promising, worries here about shared likelihoods would re-emerge. As discussed in the introduction, no atheist thinks there are examples of such miracles.

Conclusion

In this chapter we have looked at several ways we might solve the problem of the priors for Bayesian theists. One thing we can do is appeal to known frequencies, but obviously we can't do this for cosmological arguments, since we only have one piece of evidence; our universe.³⁹ Another is to endorse a form of Objective Bayesianism. But we have seen in the special case where there is no non-contingent background knowledge, which Swinburne claims is the case when we consider cosmological arguments, these all collapse to the principle of indifference. Given there seem to be a very large, perhaps infinite number of mutually exclusive rivals to restricted theism, this would set the prior probability of theism to virtually zero — disastrous for any P-inductive argument. Finally, we considered the idea that the priors don't matter, since they "wash out" as evidence builds up. But in the case of the argument between the theist and the atheist, few, if any, of the conditions required for such convergence, hold.

Clearly then, some other way of fixing the priors is needed for a Bayesian theistic argument to work. Swinburne agrees. He claims, as we saw, that we can appeal to simplicity. The simpler a hypothesis is, he tells us, the higher its prior probability. What we therefore need to investigate next, is how exactly Swinburne uses the notion of simplicity in his cosmological argument; what he means by simplicity; and why we should think there is any general relationship between simplicity and probability. These are the topics of the next few chapters.

³⁹ We'll discuss how frequent universes like ours are in Chapter 9.

4. Swinburne's Argument for Theism's Simplicity

Introduction

Swinburne, as we saw in the previous chapter, claims that $P(h)$ is high because theism is simple (Swinburne, 2004, p98). It is important to understand this defence, because in subsequent chapters, I object to it extensively. We do not enter Swinburne's cosmological argument in detail yet, as we are just now focusing on the Bayesian questions around Swinburne's argument, which he depends on in order to make his cosmological argument.

Swinburne's argument

Swinburne's cosmological argument, in brief, asserts that given the extremely low probability $P(e)$ of our world being as it is (life capable, ordered, etc.), that it is more likely that our world was made that way by an intelligent benevolent being (God), than it would be like that by sheer chance.⁴⁰ And Swinburne believes that his argument from cosmology is only a C-inductive argument. This is, as we've already mentioned, when combined with all of the arguments contained in his book, *The Existence of God*, these arguments, including the argument from cosmology, arguments raise the posterior probability of theism, $P(h|e)$ to be somewhat greater than 0.5, that therefore that God likely exists.

"I conclude that ... $P(h|e \& k)$, the posterior probability of theism on the evidence considered so far, will not be less than $\frac{1}{2}$." (2004, p341).

But Swinburne cannot make this case without showing that $P(h)$ is higher than $P(e)$. So we now introduce Swinburne's arguments for theism's simplicity, as Swinburne claims that simplicity is tied to prior probability. Swinburne offers us three arguments for divine simplicity: a *quantitative* argument, a *qualitative* argument, and a *personal* argument.

Swinburne's *quantitative* argument for God's simplicity

Swinburne argues that theism is a preferable hypothesis because it is simple, and that theism is simple because God is one entity (Swinburne, 2001, pp85-7; p97). It's better, Swinburne seems to think, that we should have only one unexplained simple entity, than multiple

⁴⁰ The details of his argument as to why this universe is improbable, are given in Chapter 8 onwards.

unexplained simple entities. So, for example, polytheism would be a more complex and hence implausible hypothesis than theism, because it proposes that there are multiple deities (cf. Swinburne, 2004, pp145-7). Yet, we prefer explanations with fewer explainers or agents (2001, p98), so we reject polytheism.⁴¹ Physicalism, likewise, by contrast to theism, also has many unexplained explainers, e.g. a whole host of fundamental particles, and so it is also less simple. Thus, since theism posits just one entity, theism is simple (Swinburne, 2004, p106, p145).

Swinburne argues in effect that God is a trade-off solution (Swinburne, 2001, p97). By adding one entity, God, we get a better explanation for our universe. Thus, although theism may add one entity, it offers greater explanatory power. Think of the example of the discovery of Neptune. Uranus has an irregular orbit (Swinburne, 1997, p52; 2001, p84, p97; Norton, 2014, p31). Scientists could only explain this by positing the existence of an additional entity: Neptune. Thus, by suggesting that there was just one extra entity, the explanatory power of science was increased. So whilst the explanation of the irregular orbit of Uranus looks like it's been made more complex by positing Neptune, it would have been even more complex to try explain Uranus' irregular orbit without Neptune. So, by analogy, if we just add one entity — God — we can better explain our complex universe (Swinburne, 2004, p108, p165).

Swinburne's *qualitative* argument for God's simplicity

Swinburne argues that God is a person of infinite power, and that his other properties are also infinite. Swinburne states that zero and infinity are the simplest quantities (Swinburne 2004, p97). His argument for this view is quite uncomplicated; namely, that we would be inclined to ask why God had specific levels of power (or goodness, or whatever), if these powers were less than infinite. For example, if God had specifically 10 watts of power, we would want to know why he had specifically 10, rather than 9.98, or 10.02, or 10002 watts, etc. If God had limited power, knowledge, benevolence, or presence, we would not consider him perfect or all-powerful, and we would want an explanation for why his properties were limited to a particular extent, and indeed, why we should bother worshipping him. When we say that God is 'perfect', it seems somehow obvious that this means that he is infinitely powerful, good, knowledgeable, etc. We would not consider a being to be perfect (the greatest possible entity of its type), if it were limited, or if there could be a greater possible entity. Hence, it seems (to Swinburne at least) that God must be infinite in all his aspects if he is to be the best possible entity.

⁴¹ This is one of the cases where it seems, *prima facie*, that Swinburne is right, and that it's not worth debating the point.

A being with zero power would not be capable of explaining anything, especially not the creation of the universe (Swinburne 2004, p97). So if zero power and infinite power are the two simplest options, and since zero power prevents us from explaining anything at all, it seems to follow again, that God should have infinite power (Swinburne, 2004, p93 et seq., p97; cf. Holder, 2002, p298) (and his other attributes ought to be infinite for the same reasons, *mutatis mutandis*).

Now, since God is (or should be) infinite in respect of all his properties, God can do anything that is logically possible for him to do (Swinburne, 2004, p94, p98). God cannot, however, bring about logically incoherent states of affairs, e.g., that I both exist and do not exist (Swinburne, 2004, p94). God also “cannot just act. He must act for a purpose and see his action in some way as a good thing.” (Swinburne, 2004, pp100-1). Yet although God’s decisions are entirely rational, (Swinburne, 2004, p98), reason does not force God to perform any particular unique action, otherwise he would not be free (Swinburne, 2004, p105). So God, Swinburne claims, is perfectly free (2004, p98), and yet still bound, in some sense, by reason and logical possibility. God must see his actions as a good thing, since he has reasons for acting. And since God is all-knowing, even if he can choose to do something else we would expect that he would always choose to act for good reasons.. “

Swinburne argues that God has to be omniscient, since any being that made everything in the universe, and who was present everywhere in the universe, would also know everything in the universe (Swinburne, 2004, p98). Such an agent, who is omniscient, can never perform a bad action, because he will always be able to see that the reasons are against it (Swinburne, 2004, p104). Since God has perfect judgment and knowledge, necessarily everything he does must be good and rational and for the best reasons. “Hence he cannot do what he does not regard as in some way a good thing.” (Swinburne, 2004, p101). God will perform the best action possible from a range of best types of actions, (Swinburne, 2004, p95, p105) and will never perform an action that is bad (Swinburne, 2004, p113). Since God is infinitely knowledgeable and omnipotent, God will always have infinite knowledge of the right thing to do, and the ability to do it (Swinburne, 2004, p98). So, because he always knows what the best thing to do is, and because he is omnipotent, God will always perform the best possible action. Therefore, again, God is omnibenevolent (Swinburne, 2004, p99, p101). So, Swinburne argues that God should have unlimited properties (Swinburne, 2004, p98).

I will follow Swinburne’s characterisation throughout this thesis, as it is common to the vast majority of theists. Now, Swinburne takes these properties and reiterates his view that because God is infinite in every way, God is the *simplest kind of person*; no further explanations of why his powers are limited in any way, is required (Swinburne, 2004, p98).

Swinburne feels, therefore that theism is the simplest hypothesis because God's power is infinite (2004, p55, p106).

“[God] is infinitely powerful, omnipotent. This is a simpler hypothesis than the hypothesis that there is a God who has such-and-such limited power...” (Swinburne, 2004, p97).

Swinburne makes a second argument for God's infinite properties (in his 1997 work, op. cit.). Large numbers, Swinburne argues, are quite hard to comprehend or visualise. Yet even someone who doesn't understand large numbers, can nonetheless understand infinity — as something continuous which does not end. So even though infinity is much larger than any large number one cares to name, it seems that we all understand what 'infinity' means. As such, infinity is in fact a simple concept (Swinburne, 1997, p28). Thus, if we want a simple explanation, presumably, the simplest explanation would be an infinitely powerful entity. And only one entity matches that description: God.

This argument seems plausible. It seems true that infinity is simple in that sense (comprehensible). So we can accept that infinity is 'simple' in some sense, and that God, if he existed, would probably be infinite, and therefore simple, in that sense. However, we also often speak of the common notion that it's "impossible" to conceive of the size of the universe, because it may well be infinite. And certainly when asked to conceive of how large a multiverse might be, this sense of incomprehensibility is magnified. This suggests, then, that even if we can understand, say, what an endlessly growing number series is, we can't conceive of it in the sense of 'visualise' it; just as we can't comprehend how large the universe is. However, perhaps what Swinburne means is that infinity isn't *denumerable*, and is in that sense an undifferentiated whole, rather than a large series of parts. We'll see later on that Craig makes this argument too, and that the type of infinity that we have in mind affects how we judge claims of divine simplicity. We'll also investigate this version of divine simplicity further in a later chapter (Chapter 6).

Swinburne's *personal* argument for God's simplicity

Let's start by characterising why personal explanations are simple. When we speak of our reasons for doing something, we generally speak of prior mental states, beliefs, goals and desires which led us to act. An action is not an action if it was not performed for a reason. If an object O is moved by an agent, S, accidentally, then O is said to *move* and S is said to have moved O (perhaps accidentally). If S intends, or has reasons to move O, then we say that S *acted* so as to move O. Thus, what makes A an action, as opposed to a mere motion, is that A

is caused by an agent having a reason for A. (cf. Swinburne, 2004, pp35-7). Swinburne therefore offers a third reason why God might be simple. Swinburne argues that personal explanations — which explain events by reference to causes from intentional agents — are simpler than mechanical explanations (2004, p38, pp48-9).

“Theism postulates God as a *person* with intentions, beliefs, and basic powers, but ones of a very simple kind, so simple that it postulates the simplest kind of *person* that there could be... So in postulating a *person* with infinite power the theist is postulating a *person* with the simplest kind of power possible.” (Swinburne, 2004, p97 [my italics]).

So God is also simple because he’s a person — with intentions, beliefs and powers (2004, p97). God is the simplest explanation for our universe because of the kind of power he has; it is the power to act immediately (without mediation). Thus, because God is omnibenevolent (wants to do the best possible thing), and because he’s omnipotent (he can do anything he wants), and because he’s omnipresent (everywhere), God is the best candidate to be the creator of all things (2004, pp105-6; also cf. p55, p96 et seq., p145, p334).

Yet why, now, does Swinburne think that God being a *personal* explanation is simpler? Well, Swinburne argues,

“The explanatory power of a hypothesis of personal explanation is, first, a matter of its ability to predict the phenomena that we in fact observe.” (2004, p65).

That is, theism is a good explanation for what we observe, because it predicts that we would have a universe like this one. In Bayesian notation, Swinburne is claiming that given *h*, the hypothesis of an infinite simple person (restricted theism), we’d expect *e*, the phenomena that we observe; i.e. $P(e|h) > P(e)$. We’ll enter Swinburne’s arguments for this view in detail in Chapters 8-9, where we consider whether theism adequately explains our universe.

Now, in the case of God, theologians usually ascribe God absolute freedom of will:

“His [God’s] intention involved in a complete explanation has no causal explanation at all, since he is perfectly free.” (2004, p80).

And this claim generally is taken to mean that because God is omnipotent, he can create anything he wishes. Swinburne opens his discussion by considering the physicalist model

known as ‘anomalism monism’, postulated first by Davidson.⁴² Swinburne argues, following his interpretation of Davidson, that one can know someone’s intentions without knowing his brain states (2004, p34, p42), and that intentions — that is, personal explanations, such as God’s — are not reducible to brain states. Intentions, for Swinburne, are directly causally efficacious; they represent a type of causal efficacy which is different to the type we see in normal scientific explanations (that is, efficient causes).

“The intention in an action that an agent is performing”, Swinburne tells us, “is not the same as any brain event that might be connected with it” (2004, p40).

“[A] personal explanation cannot be analysed in terms of a scientific explanation...” (Swinburne, 2004, p88).

“The first is that a personal explanation of the occurrence of a phenomenon E in terms of God’s bringing it about, meaning so to do, cannot be even in part explicable scientifically... But all this, as we have now seen, does not in any way weaken the explanatory value of the personal explanation. God’s bringing about some event may be explicable by a wider personal explanation.” (2004, pp48-9).

To intend to perform some action, instead, necessarily entails a “why,” or “for what purpose”; a *reason* (Swinburne, 2004, pp41-43, p44). And, Swinburne argues, we need to posit the existence of a *person* in order to adequately explain the reasons for an action. We tend to think that “John wanted to raise his arm” is a simpler explanation than a long mechanistic discussion of neurons and muscles. The general idea is that persons offer simpler explanations (acting for reasons). Therefore, we can explain this universe more simply, by reference to God’s reasons. Plantinga (in Plantinga and Tooley, 2008) makes similar claims. Purposefulness, Plantinga argues, is not conceivable in a physicalist paradigm (*sic*, 2008, pp20-25). We need a *person* or *self* to give a functional (or purposeful) explanation for an event or phenomenon, as we have to assume, in many cases, that there is intelligent, conscious design behind certain phenomena (*ibid.*, p29). Compare this to Searle’s remarks:

“The logical form of the statement ‘Agent S performed act A because of reason R’ is not of the form ‘A caused B’, it is of the form ‘A self S performed action A, and in the performance of A, S acted on reason R’. The logical form ... of rational explanation is

⁴² In Swinburne, 2004, p38. Davidson actually explains his position in *Mental Events* (1970), which Swinburne attributes to his *Actions, Reasons and Causes* (1963).

quite different from standard causal explanations. The form of the explanation is not to give causally sufficient conditions, but to cite the reason that the agent acted on. ... But if that is right, then we have a peculiar result. It seems that rational action explanations require us to postulate the existence of an irreducible self, a rational agent..." (Searle, 2001, p500).

So, a personal explanation is about reasons that a person has, and hence, is simpler than a mechanistic explanation, because the self or mind is a kind of atomistic construct, a single thing, a simple essence.⁴³

Well, what kind of person would explain our universe? God, Swinburne answers. And contrary to Mackie's mechanistic model of what a person comprises, needing nerves, muscles, and so on (Mackie, 1982, p129), God is not a physical kind of person. God is an infinite, disembodied person, not scientifically explicable (Swinburne, 2004, p48). Contra Mackie's characterisation, God's actions are generally, as we've already mentioned, not mediated; his intentions, such as creating the universe *ex nihilo*, manifest as basic acts, immediately (Swinburne, 2004, p61; pp49-50, p64).⁴⁴

We can infer, Swinburne says, based on what we know about a person, what they will probably do (Swinburne, 2004, pp38-47, pp61-4; 2001, pp75-6, p79). And since an all-powerful all-good God can be expected to exercise his powers in a good way, we can expect him to create what we may consider a "good" universe such as ours (Swinburne, 2004, p98, p105, p107); capable of life, and hosting moral beings. This is because God, as all-good, would want a good universe, or to create even more goodness.⁴⁵

Thus, Swinburne argues, theism is the more probable hypothesis in explaining this universe, for three reasons: because theism is *simpler* due to postulating (a) *one* person, offering (b) *a personal* explanation (c) having *infinite* properties (cf. Swinburne, 2004, p38-p43, p109, p152).

Using Bayes' Theorem to present the Cosmological Argument

Swinburne's aim in his cosmological argument is modest; he is not claiming that he has a P-inductive argument that the universe was created by God (that is, $P(h|e \& k) > \frac{1}{2}$), or that God exists. He claims that theism, coupled with the evidence from cosmology and others, is more probable than it would be without that evidence. His argument is therefore that $P(h|e \& k) >$

⁴³ Indeed, in his 2004, Chapter 9, Swinburne identifies the mind with the soul, which we do tend to think of as one thing, simple and unified, like God. See also Plantinga and Tooley, 2008, pp31-2.

⁴⁴ This is not to claim that all of God's acts need be basic.

⁴⁵ We'll discuss Swinburne's cosmological argument for why God would create just our universe, or one very like it, in more detail in Chapter 8.

$P(h|k)$; that theism is more plausible given the evidence of this universe (and miracles, and ethics, and revelation, etc.), than it is *a priori*. How does this result obtain?

We will see in Chapters 8-9 that Swinburne argues that God would likely create a good universe such as ours. If this is correct, it would follow that $P(e|h \& k) > P(e|k)$, that the evidence of this universe would be less surprising or improbable given theism, than it would be without theism. From this argument, and Bayes' Theorem, we can then show that $P(h|e \& k) > P(h|k)$, in other words, that the existence of a complex universe confirms the existence of God (cf. Holder, 2002, p296). For if we grant Swinburne that $P(e|h \& k) > P(e|k)$, then we must grant him that $P(h|e \& k) > P(h|k)$, since it follows mathematically; recall the equation "Reciprocal Support", $P(e|h \& k) > P(e|k)$ iff $P(h|e \& k) > P(h|k)$. The argument as presented by Swinburne, then, is that

$P(e|h \& k) > P(e|k)$, i.e., that theism explains this universe, or that this life-capable universe is more likely, given God, and, that taken with Bayes' Theorem, this entails that:

$P(h|e \& k) > P(h|k)$, i.e., that the hypothesis of theism is more likely true, given the evidence of the existence of a life-capable universe, than it would be without that evidence.

If Swinburne has at least established this latter argument, then he at least has a good C-inductive argument that it is likely God exists. As God is the sort of being who would bring about such a structured universe as ours (also in Holder, 2002, p299), and since we observe our universe, it seems to support the existence of God.

In short, Swinburne argues that theism is the *simplest* hypothesis, and it is therefore the most probable hypothesis, *a priori*.

And yet, as we mentioned in the Introduction, it seems that Swinburne is being too modest. I believe that the argument from cosmology is the strongest empirical argument for theism, and that the cosmological argument alone will suffice to support theism if Swinburne can plausibly defend it, since atheists generally accept his premise that our universe is improbable *a priori* (that $P(e)$ is very low). In other words, the cosmological argument alone could suffice as a P-inductive argument for God, $P(h|e) > 0.5$.

In the next two chapters, we respond to Swinburne's arguments about whether theism is simple. Firstly, in Chapter 5, we discuss whether scientists generally prefer simpler hypotheses (and whether this will indeed confer a higher prior probability on theism). Secondly, in Chapter 6, we discuss whether theism is simple anyway.

5. What is simplicity, and should we favour simpler hypotheses?

Introduction

In this chapter, we consider again Swinburne's view that simpler hypotheses have a higher prior probability (Swinburne, 2004, p67; Swinburne, 1997, p56).⁴⁶ This chapter asks what is meant by simplicity, and what might justify the claim that simpler hypotheses are more probable.

Simplicity as a guide to probability: some preliminary remarks

Swinburne is quite clear that he holds that some things are “too big” for science to explain (Swinburne, 2004, p74, p75); and so we might think that arguments from simplicity for theism are *sui generis*. Yet Swinburne also argues that scientists seem to prefer simpler theories, because we've observed them doing so in their praxis (Swinburne, 2004, p55, p70; Riesch, 2010, p87). One can infer, then, that Swinburne thinks that his account of simplicity matches that used in science, and that is supposed to provide support for his general claim that simpler theories are more probable. Part of what we need to do then, is analyse what role, if any, simplicity judgments play in science, to see whether Swinburne's general claims about the relation between probability and simplicity are in fact supported by scientific practice.

On the face of it, it does seem true that scientists, at least sometimes, favour simpler theories. Here's an example:

“In 1929, Hubble proposed that the speed of recession was linearly proportional to the distance. In principle, he could have fitted a complicated, tenth order polynomial function to his data. The linear dependency, however, was easier to deal with formally. If it is the wrong relation, new data would be likely to show the error much faster than with a more complicated function. A tenth order polynomial is able to contort itself to fit a larger range of data, so that considerably more data may be needed to refute it.” (Norton, 2014, p6).

⁴⁶ Not all Bayesians are sympathetic to this view, as we'll see; they argue that what we call 'simplicity' actually arises from other considerations, which we discuss below. But Jeffreys at least (in Sober, 2015, p90) agrees with this view.

Think also of the familiar case of Neptune and Uranus. It was just simpler to propose that Uranus' orbital anomaly was caused by the influence of another body, than to entertain other hypotheses, such as modifying Newton's gravitational theory. Science therefore does sometimes favour simple explanations (Sober, 1994, p153; 2015, p33). Indeed, Isaac Newton himself presents us with a number of rules for selecting hypotheses, and they are primarily around simplicity and minimising numbers or types of causes (Newton, 1713, in Sober, 2015, p33). Sober remarks (2015, p34): "Newton is saying ... that a principle of parsimony or simplicity... is a reliable guide to discovering true theories."

There are other sorts of cases where a preference for simplicity seems to be in play. Consider Newton's laws. We still use Newton's laws despite the fact that they are now regarded as special cases of Einstein's Theory of Relativity. The reason is that although they don't predict as well as Einstein's theory does (in high-velocity or high-energy cases), they work well in low-velocity low-energy cases. The reason we favour Newton's laws, then, is because they're just easier to work with — they're simpler. Clearly this preference for simplicity does not seem connected to truth, since we do not take Newton's laws now to be (strictly) true. Part of what we need to do below, therefore, is disentangle these different uses of "simplicity".

There is, as we can see, a *prima facie* case for saying simplicity judgments play some role in scientific theorising. But is simplicity the *sine qua non* of theory selection in the sciences? Swinburne does at least recognise that simplicity is not the only reason a theory is selected. Swinburne also tells us that theories' prior probabilities are determined by *fit* and *scope* (*sic*, Swinburne, 1997, p46; 2004, p65). In other words, by how well theories fit the data, and how much they explain. Moreover, it is clear when we look at some other kinds of examples from the history of science, that more complex theories often come to replace simpler theories, because those more complicated theories fit the data better, or have broader scope. For example, according to the Ancient Greeks, there were four elements: earth, air, fire, and water. Yet according to modern chemists, there are 118, of which 24 are man-made. Clearly, the *less* simple model (*quantitatively* less simple) is the more probable theory, as evident from our success with that model. If we consider *why* we prefer the modern theory, it has to do with our existing knowledge of its success, and its more accurate fit with the evidence we have. We do not prefer the modern periodic table because it's simpler; we prefer it because it works. Consider, as another example, Bohr's model of the atom. It is much simpler than that offered by Quantum Mechanics. Yet we prefer the more complex Quantum Mechanics, again because it fits better with fine observation, and arguably, because Quantum Mechanics explains much more.

So our quick overview of scientific practice offers a mixed picture. There does seem to be some evidence that appeals to simplicity are important, but it is not always obvious that

such appeals are connected with truth or high probability. Moreover, we can see that very often evidence and scope trump all, and simplicity judgments are unimportant. Now, Swinburne argues in response to the last point, that materialism/physicalism and theism have the same *scope*⁴⁷, and they have similar *fit*, that is, they both are consistent with the evidence. From this, it follows that simplicity is the only relevant criterion that we have available to help us choose between theism and physicalism (Swinburne, 2004, p58). So, at least in this case, there might be some reasons to think that simplicity judgments are crucial in deciding the matter. Moreover, as we have argued extensively in the previous chapter, there does not seem anything else Swinburne could appeal to fix the priors in his Bayesian argument for theism.

What we shall do then is first characterise what Swinburne means by simplicity. The strategy we will follow, consequently, will be to try to assess how simplicity judgments are used in science, and then see whether Swinburne is in fact relying on these types of judgments. If we can show that these judgments do not appeal to the sort of notion of simplicity that Swinburne relies on, then the usefulness of a notion of simplicity like Swinburne's will be undermined. Indeed, unless Swinburne's judgment of what "simplicity" means can be applied to theism, Swinburne cannot readily make the case that theism is a simple hypothesis (and therefore, in his view, more probably true). The discussion of that matter will, however, be drawn out in the chapter after this one.

Swinburne's models of simplicity

"Simplex sigillum veri... Simplicity is an all-important and unavoidable criterion in assessing the probability of any *scientific* theory." (Swinburne, 2004, pp59-60 [my emphasis]).

Swinburne relies on this view of simplicity throughout his book, and certainly in his 1997 and 2001 books, he claims that simplicity is such a compelling criterion, that we can even prefer a simpler theory over a stronger one:

"If one theory is superior to another in yielding the data to a higher degree of inductive probability, or in yielding more data to the same degree of probability, then as such it is more likely to be true, but any greater simplicity of a rival theory is a compensating

⁴⁷ We see him support this view in the following citations: "A physical 'Theory of Everything' purports to explain everything physical; theism purports to explain everything logically contingent (apart from itself)." (2004, p66). I read this to mean that the explanatory scope of theism and materialism in both cases, is "all contingent physical things." He then says, "Theism is a hypothesis of vast scope; but, of course, of the same vast scope as any other world view—for example, physicalism." (ibid., p72). Again, we see him imply that theism and physicalism have the same scope.

factor which could lead to equal probability overall or even to the greater probability of the rival.” (Swinburne, 1997, pp13-14; almost verbatim also in 2001, p82).

As we said above, and as these quotes establish, Swinburne thinks his account of simplicity holds good in general as a way of fixing prior probabilities. But what exactly does Swinburne mean by “simple”? Swinburne, in his 1997, 2001 and 2004 works, offers a number of interpretations of simplicity which we’ll summarise below. His arguments for these interpretations of simplicity are generally good and supported by many examples, so we needn’t rehearse the points he makes in their defence. Swinburne provides eight senses of the idea of simplicity,⁴⁸ which he seems to believe are operative in science (not just metaphysics), namely:

1. **Quantitative simplicity, few tokens:** “The first facet of simplicity is just a matter of number of things postulated. ... The application of this facet in choosing theories is simply the use of Ockham’s razor.” (Swinburne, 1997, p24; 1997, p87). “[A] matter of [the hypothesis] postulating few (logically independent) entities, ” (Swinburne, 2004, p53).⁴⁹
2. **Qualitative simplicity, few types:** “Second, number of kinds of thing...” (Swinburne, 1997, p24; 1997, p87). “[F]ew kinds of entities, ” (Swinburne, 2004, p53). Also supported by Lewis (1973, p87) (Swinburne, 2001, p83, pp85-7).⁵⁰
3. **Dependence on prior knowledge or understanding prior theories.** “Third, a formulation of a theory which contains a term referring to an entity or descriptive of a property which can only be grasped by someone who grasps some other term will be less simple than an otherwise equally simple formulation of a theory which contains the latter term instead...” (Swinburne, 1997, p24; 2001, p88).
4. **Simple, observable and few properties:** “... [i.e.] do not postulate underlying theoretical properties, unless you cannot get a theory which yields the data equally well without them.” (Swinburne, 1997, p26). “[F]ew properties of entities, few kinds of properties, properties more readily observable.” (Swinburne, 2004, p53)
5. **Few laws:** “[simplicity is] a formulation of theory consisting of a few separate laws is (other things being equal) simpler than one consisting of many laws...” (Swinburne, 1997, p26; 2001, p89).

⁴⁸ In the quotes that follow, the emphases and edits are mine.

⁴⁹ Compare to Norton’s “Ontic Simplicity” (Norton, 2014, pp10-12)

⁵⁰ Lewis (1973, p87) draws this distinction and rejects quantitative parsimony as a requirement for science.

6. **Few variables:** “[A] formulation of a theory is simpler in which individual laws relate few variables rather than many...” (Swinburne, 1997, p26). “Few separate laws with few terms relating few variables,” (Swinburne, 2004, p53; 2001, p90)
7. **Mathematical simplicity:** “(other things being equal) a mathematically simpler formulation is simpler.” (Swinburne, 1997, p26; 2001, p90). “The simplest formulation of each law being mathematically simple.” (Swinburne, 2004, p53).⁵¹
8. **Quality of fit with evidence or background knowledge** (2001, p95; Swinburne, 1997, p53). “[T]he criterion of simplicity [...] determines which proposed theory ‘fits best’ with those neighbouring hypotheses. ‘Fitting better’ is ‘fitting more simply’, and thus making for a simpler overall view of the world.” Theories must cohere particularly well or naturally with our existing theories and evidence. Another way to put it, for Swinburne, is that “Simplicity is a matter of the regularities [theories or laws] fitting together.”⁵²

In Bayesian terms, we can see that some of these senses, e.g. 5 and 6, clearly have to do with $P(h)$ — the prior probability — and some, like 8, have to do with $P(e|h)$ — the likelihood. Simplicity, then, for Swinburne, is playing a role in fixing *all* the elements within Bayes’ Theorem. Let us discuss some of these senses outlined above in detail, and see whether they map onto actual scientific praxis.

Discussion: Senses 5, 6, 7: Mathematical Simplicity, Few Variables, Few Laws

Let us begin with mathematical simplicity. First we will discuss how one might characterise mathematical simplicity, and then we will turn to discuss why we might think such simplicity is connected to probability.

1. Extrapolation

The first model, the **extrapolation** model of mathematical simplicity, relates to how it is easier to predict a future event from a simpler formula, by extrapolating a graph. It is not the explanatory or predictive power that makes the hypothesis simple *per se*. Rather, it’s the

⁵¹ Swinburne elaborates on the mathematical version on 2004, pp54-5. Compare to Norton, 2014: “Simplicity as Mere Economy of Expression” — scientists will select the tersest summary, expression or mathematical formula to describe a phenomenon (Norton, 2014, pp7-8), or Norton’s “Descriptive Simplicity”, or curve-fitting (Norton, 2014, pp14-19).

⁵² This is Swinburne’s interpretation of Lewis, in Swinburne, 2004, p30 (See also 2001, p95; 1997, p53). One might object that the sense of simplicity in (8) is not an *a priori* sense of simplicity; even though Swinburne seems to think that our preference for simplicity is *a priori*. However, Swinburne’s claim is just that our preference for simplicity is *a priori*, not that our measurement of hypotheses’ simplicity is *a priori*.

inherent mathematical features of the formula or hypothesis. That is, mathematical simplicity lends itself to greater predictive power. A simpler theory, this model claims, has higher $P(\text{elh})$, that is, better predictive power. Thus, it's not the simplicity itself that is represented by the high $P(\text{elh})$, but instead, simpler equations yield a high $P(\text{elh})$. Yet here is Swinburne's objection to this model:

“Sometimes people ignore [simplicity] and say that what makes a theory probable is just its explanatory power, or, worse still, just the fact that we can deduce from it statements reporting the phenomena that have been observed, our data or evidence. The trouble with this claim is that, for any finite collection of phenomena, there will always be an infinite number of different theories of equal scope such that from each (together with statements of initial conditions) can be deduced statements reporting the phenomena observed with perfect accuracy.” (Swinburne, 2004, p58).⁵³

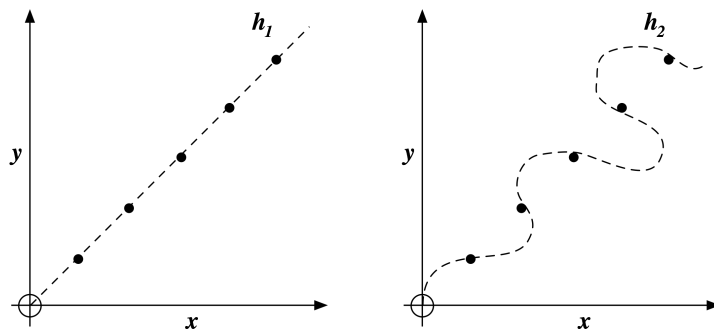


Figure 2. Simple and Complex Hypotheses

Consider the case where we extrapolate a graph onto unknown or unmeasured values. Our preference is for a straight line through data points on a graph.⁵⁴ Consult for example the two graphs depicted in Figure 2.

We can see that the graph of h_1 is far easier to extrapolate. A theory or hypothesis that better predicts, i.e. which has greater predictive power, lets us extrapolate more easily (cf. Swinburne, 2001, p101). Since h_1 is easier to extrapolate, it therefore has greater predictive strength, because it is mathematically simpler. Yet what Swinburne is arguing above, is that h_2 might be true — as it covers all the data — but we select h_1 just because it's simpler.

⁵³ cf. Sober, 2015, p88.

⁵⁴ Swinburne, 2004, p30, p58; 2001, p95; also in Norton, 2014, pp14-17; Howson, 2011, p129 Swinburne, 2004, p30, p58; 2001, p95; also in Norton, 2014, pp14-17; Howson, 2011, p129

2. Number of Adjustable Parameters/Few variables

Another intuitive way to characterise mathematical simplicity, endorsed by Swinburne, holds that a theory is mathematically simple if it has *few variables* in its laws or formulae, or if the relevant formulae are simple (Swinburne, 2004, p53, p55, pp56-8; 1997, p26; 2001, p90). So, Swinburne explains, “addition is simpler than multiplication, multiplication than powers; scalars than vectors, vectors than tensors, and so on.” (Swinburne, 2004, pp54-5). Let’s take it that variables or parameters of a formula which we can adjust, make the formula more complex (cf. Bandopadhyay and Brittan, 2010, pp50-51). That is, the sum of the number of *adjustable parameters* indicates how complex the hypothesis is (Jeffreys in Sober, 2015, p88, 17n, also p137).⁵⁵ The more adjustable parameters, the less simple the theory (or equation) (cf. Bandopadhyay and Brittan, 2010, pp50-51; Jeffreys in Sober, 2015, p88). This has some intuitive appeal. We certainly think that “harder” formulae are less simple.

Criticisms

Both of these interpretations of mathematical simplicity are, however, problematic. We’ll leave aside discussion of extrapolation for now. Let us consider first the claim that a theory is simple if it has few variables and simpler mathematical operations. On this understanding, an equation of the form $y=x$ is simpler than one of the form $y=x^2$. But obviously, a change of variable can change the form of the equation. Take $z=x^2$ for example. We can re-write the two equations ($y=x^2$ and $z=x^2$) as $y=\sqrt{z}$ and $y=z$. Now the second equation ($y=x^2$) comes out as simple as the first ($y=x$, $y=z$).

To make an account like this even coherent, then, we need a principled way of selecting the right variables that we are supposed to use in making our assessment of simplicity. One might be doubtful that there are such ‘true’ variables, if we reflect on how content scientists are to use multiple formulations of the same theory. In fact, reflecting on cases of theories with multiple formulations can clarify just how odd Swinburne’s view seems to be. Take Newtonian mechanics. We can write out the fundamental law as a simple functional relation, $F=ma$, or as a second-order differential equation $F=md^2y/dx^2$ or as in the Hamiltonian or Lagrangian formulation — the latter being a first-order partial differential equation. These do not seem to be all equally simple, according to Swinburne’s account. One might think, then, since simplicity is meant to be a guide to probability, that these different expressions, each more complex than the next, would mean that they ought to have different

⁵⁵ We’ll discuss a similar idea, the Akaike Framework, below.

prior probabilities. But that is, of course, nonsense. They are different formulations of the same theory; and so must all have the same probability.

Another problem with the second suggestion, that simpler theories have fewer adjustable parameters, runs as follows. Consider the following argument (in Howson, 2011, p135). Howson gives us three equations representing three hypotheses.⁵⁶

$$\begin{array}{ll} H_1: y = a + bx + cx^2 & c \neq 0 \\ H_2: y = a + bx & b \neq 0 \\ H_3: y = a + bx + cx^2 & c \neq 0 \text{ and } c \text{ is fixed.} \end{array}$$

The first equation, H_1 , is a version of the third, H_3 , but H_3 is more specific: c is fixed in H_3 , unlike c in H_1 . Otherwise the equations are identical. This means that the only difference between H_1 and H_3 is that in the case of H_1 we can vary a, b, c , but in the case of H_3 we can vary only a and b . Since in the case of H_3 , c is fixed, meaning that to all intents and purposes, the number of adjustable parameters is the same between H_3 and H_2 . So, $P(H_3) = P(H_2)$, if mathematical simplicity in terms of numbers of adjustable parameters, is how we define whether a formula is simple. Now, H_2 has fewer adjustable parameters than H_1 . Thus, $P(H_2) > P(H_1)$. However, Howson argues, H_3 entails H_1 since H_3 is just a special case of H_1 . Thus, since H_3 is just a version of H_1 , it follows that $P(H_3) \leq P(H_1)$. If, on the other hand, $c = 0$, we can see that H_2 just is the same as H_1/H_3 and is thus a special case of H_1/H_3 . Hence, even if H_2 is simpler than H_1/H_3 , H_1/H_3 are the more likely hypotheses, since H_2 is merely a special case (also Popper in Sober, 2015, p92).

Yet, Howson argues that H_2 , the second equation, should have the same probability as H_3 , because they both have the same number of adjustable parameters (namely, only a and b are adjustable), and thus they have the same degree of simplicity, as we've seen above. Similarly, H_2 should be more probable than H_1 , because H_1 has more adjustable parameters (a, b, c). So, H_1 is less probable than H_2 . Yet if H_1 and H_3 are equiprobable (or H_3 is less probable), it means that H_3 ought to be less probable than H_2 . But this is impossible, as the inequalities (greater-than/less-than) must be transitive. That is, if $P(H_1) < P(H_2)$, and $P(H_3) \leq P(H_1)$, then $P(H_3) < P(H_2)$. Yet according to the number of adjustable parameters, $P(H_2)$ and $P(H_3)$ are equiprobable, so we have a contradiction (Howson, 2011, p135). It seems, therefore, that it is difficult to make Swinburne's claims about mathematical simplicity coherently.

⁵⁶ The same argument is presented by Sober and Jeffreys in Sober, 2015, p89; the argument is attributed to Jeffreys.

Simplicity as a guide to probability

Setting aside the serious concerns we raised in the last section, let us now consider why anyone might think there is a connection between mathematical simplicity and probability. Although Swinburne is not very explicit about the motivations, there are two which seem plausible. One way of ascertaining the probability of a hypothesis, as we saw, arises from general considerations of scientific praxis and what we have called here *extrapolation*. The second way of ascertaining the probability of a hypothesis based on its mathematical simplicity, is not found anywhere in Swinburne's work, but forms part of more sophisticated analyses of simplicity found in the philosophy of science literature, namely the *Akaike Framework* (in Sober, 2015, 2016). It deals, again, with the number of adjustable parameters, which we discussed above. But we shall see neither of these considerations can be used to support the idea that theism being *simple* entails that it is more probable.

Extrapolation

The first model, **extrapolation**, is motivated by an observation about scientific practice. Scientists seem to prefer to extrapolate beyond the data by using the simplest formula they can find. We have already noted an example of this in Hubble's preference for a linear relationship between the speed of recession and distance of far away galaxies. It is not the explanatory or predictive power that makes the hypothesis simple *per se*. Rather, it's the inherent mathematical features of the formula or hypothesis. So here it seems there is an implicit appeal to simplicity as a guide to truth.

Consider again the case where we extrapolate a graph onto unknown or unmeasured values. Our preference is for a straight line through data points on a graph.⁵⁷ Consult the two graphs depicted in Figure 2 again. We can all agree that that h_1 seems to be the 'right' line to draw through these points. But both h_1 and h_2 predict all the data equally well, so it seems that in selecting h_1 we are guided by simplicity, as Swinburne tells us. Yet is it always true that the formula that is easiest to extrapolate is more likely true? It is not.

Consider, for example, the relationship between phases of matter (e.g. water), temperature, and boiling/freezing points. One would think, *prima facie*, that it would be quite likely that the temperature and pressure graph would extrapolate in a straight line, that is, as temperature increased, and pressure decreased, that along the straight line, water would form ice; this is undoubtedly the simplest relation. However, the graph is actually semi-

⁵⁷ Swinburne, 2004, p30, p58; 2001, p95; also in Norton, 2014, pp14-17; Howson, 2011, p129

logarithmic. The same applies to the population of microbes in a host; one might continuously expect exponential growth, that again is the simplest extrapolation. However one has to factor in nutrient exhaustion, leading to a non-linear population graph. As another example, consider a graph of acceleration of an object in free fall, of position versus time. The graph is a curve, and its equation is not “simple”, yet it extrapolates. A graph of an object moving irregularly, would not at all be simple, and would not be possible to extrapolate for other objects. Yet such a graph would be accurate, and its characterisation of the movements true.

Thus, the idea that a simple graph, easy to extrapolate, indicates the truth, is false. What matters, rather, is whether the graph or formula accurately represents or models the scenario, not that it's necessarily simpler. And Swinburne recognises this concern:

“True, sometimes the simplest theory hasn't proved the better predictor. ... However, even this modest claim about the history of science—that usually the simplest theory has proved the better predictor seems very doubtful. In many areas of inquiry the simpler ‘laws’ which served well in the past have been replaced by more complicated laws...” (Swinburne, 1997, pp46).

In this passage, we see Swinburne concede a much weaker position; namely, that sometimes the simpler theories have been superseded. And here he seems to be correct. The point is that it's not the simplest theory, or the easiest theory to extrapolate from, which is most likely true. Rather, it's the best theory that wins; where “best” means, it actually predicts what will happen (regardless of how difficult the mathematics are). And that is an objection which can be extended to theism. Even if theism is the simplest explanation for our universe, it doesn't mean it's the best, and therefore likely true, unless it predicts the evidence the best of all the competing theories — and that is something we'll discuss in Chapter 8.

But why then, we might ask, do we see scientists apparently fixing on simple formulas in their practice? Perhaps our preference for simpler hypotheses is not that they're more likely to be true, but just that they're easier to use in the scientific process. For example, as we argued earlier, we prefer to use Newtonian mechanics in many applications, rather than Quantum Mechanics or General Relativity; not because we think Newtonian mechanics is closer to the truth than these theories — we know it is not — but because the theory is often easier to work with due to its greater simplicity. We know that Newtonian Mechanics will often produce accurate predictions, if we limit its applications to low velocities, and scales between the atomic and the astronomic.

Another reason to prefer simpler theories, is also because simpler theories are easier to test or refute. Think back to the two graphs earlier in Figure 2. The straight line graph has a very simple equation ($y=a+bx$). The second graph would have a much more complex equation, with many adjustable parameters. In a fairly straightforward way, we can see that

more data is required to refute the second theory than the first. Popper points out that in order to falsify a hypothesis like h_1 , we would need only three data points to show the relationship was non-linear.⁵⁸ But in the case of the second graph, we would need many more data points to reject the hypothesis shown in h_2 (cf. Popper in Sober, 2015, p91, p93).

A different but related idea can be found in the work of Kevin T. Kelly.⁵⁹ He shows, given certain assumptions, that starting with the simplest hypothesis is often the most efficient method for discovering the true hypothesis. So, to take a simple example, say a new particle is postulated. What attitude ought we to take to its existence? One strategy would be to reject its existence (the simplest hypothesis). Another attitude would be to think it does exist, but after say, 1000 failed attempts to detect it, to surrender the hypothesis. Kelly and others⁶⁰ argue the first, simpler hypothesis (that it does not exist) is to be preferred, because in adopting that, you would have to change your mind at most once; that is, if the particle was discovered. If the alternative strategy was pursued, then you could have to change your mind twice, first, when you get to 1000 attempts and find no particle, and then, if the particle was say discovered on the 1001st attempt, you'd have to change your mind again. A preference for simplicity, in these cases, is therefore a pragmatic matter (Newton-Smith, 1996, p231; Norton, 2014, pp6-7; Riesch, 2010). Norton calls this model "Simplicity for Economy of Search"; that is, scientists use simplicity so as to start searching for the most probable hypothesis, since it's just easier to test the simplest hypothesis (Norton, 2014, pp5-6; Popper in Sober, 2015, p93). Starting from the simplest hypothesis, we can minimise the number of times we have to change our mind. The principle of simplicity, then, seems to be a contingent pragmatic rubric to identify easily testable theories.⁶¹ Most importantly, however, nothing in these sorts of cases suggest that simplicity is linked to a higher prior probability.

The Akaike Framework — Adjustable Parameters

But we want to show that there is some role for simplicity judgments in theory or model selection. A more technical reason for thinking simplicity is a guide to theory choice is given by the **Aikake Framework**. This framework gives a measure of the mathematical simplicity of a formula, and hence, its probability (Hirotugu Akaike, 1973, in Sober, pp130-131). The framework tells us that a model's ability to predict, and therefore its accuracy, is *estimated* by measuring how well it fits evidence (the likelihood), using the calculation of log-likelihood [$\log(\text{Pelh})$]. Furthermore, the Akaike framework tells us, a model's simplicity is measured in

⁵⁸ Two points could have a line drawn through them, but if we have three data points, and the third is an outlier, we have found counter-evidence to the straight line theory.

⁵⁹ See e.g. Kelly, 2007

⁶⁰ See e.g. Schulte, 1999

⁶¹ Newton-Smith, 1996, p231; Swinburne, 2001, pp101-102; 1997, pp46-7; 2004, p54; Norton, 2014, pp6-7

terms of the number of *adjustable parameters*, which I'll call a . The Akaike Information Criterion (AIC), then, is given as the quantity $[\log[P(\text{elh})] - a]$. The higher the AIC score, the better the model would lead us to expect the evidence; the lower the score, e.g. because of greater numbers of adjustable parameters, the worse the model's ability to predict the evidence (Sober, 2015, pp130-1).

From these considerations, we can at the very least conclude that it's possible to objectively calculate how well a theory would lead us to expect the evidence, and therefore, how much we should give it credence. And we see that the more complex the theory is, in terms of parameter a ,⁶² the worse the score.

Yet there are three special conditions under which the Akaike framework holds. (i) Firstly, any new data must come from the same underlying reality as the old data, which Sober calls the "a uniformity of nature assumption." This assumption means that underlying the data is a predictable curve or graph which could map specifically selected x -coordinates to y -coordinates on a graph, or *vice versa* (Sober, 2015, p133). (ii) The second assumption, Sober tells us, is "that repeated estimates of each of the parameters in a model will form a bell-shaped distribution." (ibid.). (iii) And the third assumption (ibid., p134) is that one of the models is true (i.e. that it's not the case that both competing hypotheses are false).

Clearly, these do not entirely hold for Swinburne's case, since he cannot fulfil all of these criteria. Considering these criteria individually, clearly, the data being used comes from the same underlying reality, however, theism is not the sort of thing that could be graphed. This puts paid to the second criterion too, since again, there are no ways to estimate the "parameters" of theism and put numeric values to them. Only the last criterion, that one of the hypotheses is true, is met; that is, for Swinburne, either theism or physicalism is ultimately true.

Finally, and most importantly, the Akaike Framework is not a framework which guarantees a simpler hypothesis is closer to the truth, only that a simpler hypothesis will be more *predictively accurate* if the above assumptions hold (which they don't, for theism). Again, it is worth pointing out that there is no connection here established between prior probability and simplicity, or prior probability and truth, let alone the sort of very general connection Swinburne needs for his argument. So, as interesting and important as the Akaike Framework is, it cannot provide a model of simplicity that will work in the way Swinburne wants, because theism fails to meet at least two of the criteria it requires for its measurements.

⁶² In Akaike this is given as k . I use a here to avoid confusion with k , background knowledge.

Discussion: Senses 1, 2, 4: Occam's Razor

We now turn to the matter of Occam's Razor. Occam's Razor may seem to be the most relevant interpretation of simplicity to refer to for Swinburne's project. As we know, Occam's Razor tells us to prefer explanations with the fewest theoretical entities. In Senses 1, 2 and 4 above, we see Swinburne claim that simpler hypotheses posit *fewer entities with fewer properties*. Certainly, most of that is true of theism. Theism postulates one entity (God) with four properties: omniscience, omnipresence, omnibenevolence, and omnipotence. This certainly seems simpler than physicalism, which offers hundreds of particles with many strange properties (spin, quark flavour, charge, etc.). As we mentioned earlier in the thesis, the benefit of theism is that we get one entity which explains the cosmos. But does theism really adhere to Occam's Razor?

If we look at the detail of Swinburne's Senses 1, 2 and 4, we see that it's not just that simplicity is about few entities with few properties. It's also about the properties being *observable*, and that there should be fewer *types* of entities. These pose a problem for theism; because clearly God is not observable, and he's an additional (spiritual, transcendent) type of entity. But there are further difficulties.

Elliott Sober introduces a useful distinction. When thinking about Occam's razor we may mean what Sober calls the "Razor of Silence" or the "Razor of Denial" (2015, p12). In the former, we are admonished not to pass judgment on whether some object or cause exists; in the latter, we are led to the stronger position of denying its existence. Let's take a concrete example from Mill of the *razor of silence* at work: someone falls off a cliff and was said to have taken poison just before. There's no reason to suppose that the poison caused the death (Mill in Sober, 2015, p49). Thus, *the razor of silence* (silence about the effect of the supposed poison), leads us to discard the hypothesis that poison was taken, since poison was not necessary to cause this particular death.

We can generalise the *razor of silence* as follows. Take explanatory causes C_1 and C_2 . We propose that C_1 is sufficient cause of event E without recourse to C_2 , i.e. we prefer the hypothesis that C_1 is by itself is an adequate explanation of E , to the hypothesis that $C_1 \& C_2$ is the explanation for E . How is the *razor of silence* a version of Occam? Well, it bids us to not multiply explanations or entities.

The *razor of silence* appears to be a well-motivated principle. If we have no reason to think C_2 is part of the cause, we ought not affirm that it is. The same razor, we might think, might be applied to theism. If we have evidence for physicalism, and the evidence, as Bishop (2007a) tells us, for its competitor, theism, is scarce, the *razor of silence* bids us ignore or disregard the hypothesis (theism). We see this in Laplace's famous statement: *Je n'avais pas besoin de cette hypothèse-là*. This is a position of agnosticism; we don't know whether

theism is true, so we simply do not pass judgment on it — we keep silent (Sober, 2015, p12). So, on this construal of Occam's Razor, we see that the razor fails to support theism, even though Occam's Razor is a form of what we mean by simplicity.

Sober then describes a "Razor of Denial", which, by contrast to the "Razor of Silence", *denies* C_2 in the formulation above. So the *razor of denial* asserts that $[C_1 \ \& \ \sim C_2]$ is a better explanation than $[C_1 \& C_2]$. It is less clear, however, what could justify this claim. Here's a possible case: take again the case of a person falling off a cliff after taking poison. Suppose we were just told that the person was *believed* to have taken poison (compare: God was believed to have caused the universe). Yet, take it also that we see no evidence of poison; no empty poison bottle, no stain on the corpse's mouth, etc. (compare: God is hidden), the individual had no access to poison and so on. The *razor of denial* bids us deny that the person took poison, because the fall was sufficient to cause death, and we have no evidence of poison apart from hearsay, and some good reasons to think no poison was taken. Here, the *razor of denial* seems justified, because we have antecedent and independent reasons to think that poison was not taken, and no good reason to think it was. In other words we already consider C_2 *improbable*. Applying this as before to cosmology, where C_1 is perhaps the "Big Bang", and C_2 is God, the *razor of denial* again proposes that $[C_1 \ \& \ \sim C_2]$ due to there being evidence for C_1 and a lack of clear unambiguous evidence for C_2 . This, in effect, is the argument offered by atheists (Sober, 2015, p12). Again, this would only appear to be a good argument, if there were antecedent reasons for denying C_2 . I take it atheists think there are such reasons, and we shall look at some of them in Chapter 11.

However, both the razors of silence and denial have this in common: they bid us to ignore or deny redundant causes or explanations. As we have seen, the *razor of silence* seems like a very reasonable principle, and the *razor of denial* can be motivated in particular circumstances where we have good reason to think the redundant cause is unlikely. However, none of the above considerations give any reasons to suppose that in general, it is better to posit fewer entities than many, if those entities and causes are doing important explanatory work. Take chemistry again. We have ended up with many more elements than the four posited by the ancient Greeks. But no-one seriously thinks our current chemistry is any the worse off because of that. If Swinburne's general view were correct, then we ought to give a higher prior probability to the Ancient Greek chemistry than our own. Assuming that is something we can make sense of, that claim seems entirely unmotivated. The uses of Occam's razor that Sober highlights, then, do suggest that sometimes simplicity plays some sort of role in theory choice; but again, this is not the sort of role that can help Swinburne.

Discussion: Senses 3 and 8: Background knowledge and simplicity judgments

Let us turn, finally, to consider the remaining items on Swinburne's list, in particular, those that relate to our background knowledge. Swinburne tells us that k is general "background knowledge, of what there is in the world and how it works." (2004, pp66-7; p146). Swinburne also tells us, in his Senses 3 and 8 of simplicity described above, that theism fits with our existing knowledge k , and this seems to mean that fit is an indicator of simplicity, and hence higher prior probability (*sic*, q.v. 2001, p95; 1997, p53; 2004, p53). Furthermore, Swinburne tells us, in science, background knowledge is "by far the major determinant of choice among theories equally able to yield the data." (1997, pp36-7). This last remark seems correct. In fact, we shall argue below that in many cases, appeals to simplicity in scientific practice are really just appeals to background knowledge. But before we do that, we need to remind ourselves of the special status of background knowledge k in the cosmological argument.

Normally, a scientific explanation would refer to existing theories in k . However, as Swinburne points out, since theism aims to explain even the scientific laws and theories, as theism is a "theory of everything", it follows that contingent evidence and existing scientific theories are part of the explanandum, e (2004, p60). He tells us: " e is our phenomena to be explained and other relevant observational evidence." (2004, pp66-7). Swinburne also tells us that k , in the special case of the cosmological argument, only contains 'tautological' data (2004, p89, also p47, p93),⁶³ presumably *a priori* truths (Swinburne, 2004, p47, p60, p66).

"A 'Theory of Everything' will have no contingent background evidence by which to determine prior probability. Prior probability must then be determined by purely *a priori* considerations." (2004, p60).

The reason, Swinburne explains, is that theism has such large scope, as a "Theory of Everything", that it aims to explain everything that is "logically contingent — apart from itself." (1997, pp50-51; 1997, pp36-7, p40; 2004, p60, p66). Hence, there is no applicable background knowledge with which theism has to fit (*ibid.*, also 2004, p66, pp71-72). And this seems to be the full extent of Swinburne's treatment of k in his *Existence of God*.

Simplicity as a proxy for background knowledge

Thus far, we have seen that Swinburne's models of simplicity do not capture the notion of

⁶³ As we mentioned earlier, some writers such as Dawes (2009), pp128-131, contest this.

simplicity at work in science, or why scientists would prefer any particular hypothesis. Swinburne's view is in part motivated by his claim that his account of simplicity is at play in actual scientific praxis. We have found no strong evidence of that, and so, in this final section, we turn to consider the role that background knowledge plays in judgments of simplicity and theory choice.

It seems that in science, theory choice has to do with k . As we observed above, in Swinburne's Senses 3 and 8 of simplicity above, he claims that theism fits with our existing knowledge k . It seems, however, that Swinburne nonetheless does not clearly characterise how the hypothesis of theism is related to k , and more specifically, $P(e|h \& k)$; the likelihood of e in the context of h and also k . For if k is devoid of empirical evidence, as Swinburne tells us (*sic*, 2004, p60), how is k even relevant to the cosmological argument — should Swinburne not simply remove it from his equations? What we'll see is that in fact, k is all-important, not only in determining whether a theory is simple (as Swinburne himself notes in Senses 3 and 8), but why we might support or select any particular hypothesis at all.

Let's start by considering a toy example from John Norton, which shows why we might prefer a simpler theory. This discussion will show that k is in fact crucial to judgments of simplicity. The point will then be elaborated by looking at a real scientific case.

We see a series of bird footprints in the mud, one after another. We have a number of possible hypotheses: that two one-legged birds hopped behind each other (on opposite feet), or that a large number of one-legged birds all landed in a row at the same time on alternating feet, or, that there was one bird walking in a line. Clearly, we choose the latter explanation, that there was one bird who walked in a straight line. We might express our preference for this claim by saying the latter hypothesis is simpler. Now, continuing the example, Norton supposes, further down the beach, we find a confusion of footprints. Normally, we'd assume that lots of birds made them, however, in this case, the simplest explanation is that our single bird suddenly got busy and waddled around on the spot. Yet in this case, we might reasonably prefer the many-birds theory. So, in fact, it is not simplicity (a dogmatic one-bird theory) that leads us to our conclusions; rather, it is our knowledge of bird behaviour. We almost never see a bird waddling around on one spot (rather, many birds), and we probably have never seen two one-legged birds hopping in single file on alternating feet (Norton, 2014, pp3-5). Expressing these ideas in Bayesian terms, we think that it is very unlikely, given what we know about bird populations, that there are a lot of one-legged birds around, so we give the hypothesis on that basis a low prior. Equally, it seems very unlikely, even if there are one-legged birds around, that they would land just in that pattern. In other words, the one-legged hypothesis seems a poor explanation of the pattern; and so the likelihood $P(e|h)$ would be low. Hence, our background knowledge k determines the support for our theory. The type of thinking that Norton describes here is commonplace in scientific judgments. Now consider a

real example from biology due to Sober.

Sober starts with the premise that the minimum number of evolutionary changes are to be preferred in giving an explanation for similarity between species (1994, p147); which we might take to be a version of the preference for “simplicity”. He starts by pointing out that sparrows and pigeons have wings, whereas iguanas do not. Two explanations, he continues, suggest themselves: (a) Either there was one evolutionary change, from the presumably dinosaur ancestor, that led to birds all having wings, and reptiles not, or, (b) sparrows and pigeons evolved separately, and in their ancestral lines, each received an evolutionary change that caused the development of wings (p148). Clearly we prefer the first hypothesis, since there’s only one evolutionary change; the change that caused the development of wings, in which later on, the birds diverged into sparrows and pigeons. Clearly also, the second hypothesis, that each species had its own wing-evolution event, is implausible to us (p149). In all of these cases, there’s an underlying background knowledge that evolutionary changes are rare or improbable. Moreover, we also have background knowledge that birds are indeed closely related to each other (genetically), and so, the odds of birds evolving wings twice, again, is low. We should therefore prefer hypotheses which favour fewer such events (p150). And this gels with the intuition of Occam’s Razor; to minimise numbers of events, entities, causes, etc.

However, and this is where Sober drives home the point. In a case where there’s a similarity which does *not* originate in a single evolutionary event, we cannot make the assumption that there was a single original evolutionary event, even though it’s simpler to do so. The example Sober gives (1994, p149) is of snakes and crocodiles which both lack wings. That they both lack wings does not show that they have a common recent ancestor (in the same way that, perhaps a better example, bats, moths and birds do not have a common recent ancestor, even though all three species have wings). In the case of comparing snakes, crocodiles and robins (Sober’s example), we can’t tell which species is closer to which on the basis of winglessness or wingedness, because winglessness is a feature of all of their ancestors, and only one change was required to create the winged status of a robin. Whilst it is simpler to assume, on the same principles as the pigeon/sparrow example, that crocodiles and snakes must be closely related because they lack wings, this is clearly wrong and no biologist would make that inference just because it is simple. Why not? Because the same background knowledge is at play; we know that winged vertebrates are rare in the fossil record for example and so wingless is the norm. It seems that in this case, our background knowledge leads us to take the less simple hypothesis — viz., that crocodiles and snakes are not that closely related, even though they both lack wings, and their lack of wings is not a reflection of a recent evolutionary event.

In all of these biological cases provided by Sober, the operative idea is actually the

Bayesian *likelihood* ($P(e|h \& k)$): how likely the evolutionary feature e is, given a hypothesis h about how the evolution occurred *and* the assumption that fewer changes are preferable, k and what we know about ancient species. It's not the fact that fewer changes — a simpler explanation — is desirable *a priori*. Rather, it's the fact that fewer changes make a particular feature more likely given our background understanding of the evolutionary process and the tree of life. So, what matters is how likely a particular change is on a particular evolutionary branch ($P(e|h \& k)$), rather than the simple number of changes (Sober, 1994, pp150-151). It is not simplicity, then, that is relevant in determining the most probable hypothesis (Sober, 1994, p152). What is relevant is the background knowledge of how evolution occurs, and how species are related to each other, and what the best theory is given that knowledge.

Theories are preferred because of k

Parsimony (or simplicity), Sober tells us, is only relevant, therefore, because it impacts the likelihoods ($P(e|h)$), not the priors (Sober, 1994, p147, pp150-152). Preference for hypotheses is judged on concrete reasons or evidence, data in k (Sober, 1994, p153; 2015, p90), not *a priori* considerations of simplicity. From the above considerations about birds and reptiles, we can see that we prefer theories for reasons *other than* their simplicity; specifically, that the theory better fits with our existing background knowledge. We might conclude that simplicity is therefore not a feature of a hypothesis, but rather a feature within the explanatory framework of h itself, namely how it relates to k . A theory's simplicity is thus localised and contextual in each case in relation to k (Sober, 1994, pp139-140). What even counts as a parsimonious (simple) feature of a hypothesis might vary between hypotheses (Sober, 1994, p152). As Sober (2015, p90) argues, simplicity does not entail a value for $P(h)$. Rather, it is *evidential support* that informs our theory choice. Norton exhorts us, "We should not infer to more than that for which we have good evidence." (Norton, 2014, p13).

"... parsimony is not a scientific end in itself. When parsimoniousness augments a hypothesis' likelihood or its prior probability, well and good. But parsimony, in and of itself, cannot make one hypothesis more plausible than another." (Sober, 1994, pp139-140).

We generally take it that k contains background knowledge (not just tautological evidence), that is, k contains data that informs our theory when we try to explain e , the evidence.- So, instead, Norton argues that simplicity is actually a "surrogate for background facts," k (2014, p3). It's not that we choose theories because they're simpler; we choose theories because they better fit our understanding of the world. Background knowledge, then, contributes strongly

to how likely an hypothesis is (Sober, 1994, p152; Norton, 2014, pp3-5). What we consider the “simplest” explanations are in fact those explanations that “make the most sense” to us in the context of existing knowledge, those that “fit” the data with a greater degree of probability (Swinburne, 2001, p95) rather than necessarily those with the simplest formulations. And here Swinburne is correct:

“For whether a narrow theory ‘fits with’ background knowledge is a matter of the simplicity of the conjunction of the postulated theory with that background knowledge.” (Swinburne, 2004, p60).

Yet, it’s worth pointing out that if something “fits” with the evidence and background knowledge, then that is a matter of *fit*, not simplicity *per se*. “Fitting more simply” with the evidence and background knowledge, is the wrong turn of phrase. What we need to say is that theories *seem* simpler if they fit *better*, that is, if we don’t have to adjust our background knowledge to meet the new theory. We consider an explanation “simpler” if it meets our expectations given our background knowledge. So to use a previous example, it is simpler to assume that one bird made many footprints in a patch. However, from our background knowledge of bird behaviour, it’s “simpler” to assume there were many birds. So in this example, Occam’s Razor fails; “simpler” in this case means *more* birds.

So what could be in *k* that might lead us to prefer a specific hypothesis to explain our universe, if indeed it is *k* that provides the support? Certainly, when scientists go out to explain cosmology, they hold theories like Quantum Mechanics and General Relativity in *k*. And it is these theories that do the explanatory work, that are taken by scientists to be in *k*, not *e*. Consider Swinburne’s words:

“But, if *k* contains logically contingent evidence of what there is in the world and how it works, $P(h|k)$ will depend also on how well *h* fits in with that evidence.” (2004, p67).⁶⁴

That seems right. We don’t, therefore, just accept a hypothesis because it is the simplest (Howson, 2011, p124); rather we accept it because it fits our existing knowledge *k*. Of course, as was shown above, we don’t, in fact can’t, have that kind of knowledge in the case of the cosmological argument. So, this is another case where something like simplicity judgments (as a proxy for background knowledge) are playing a role in scientific theory choice, cannot be applied to Swinburne’s argument.

⁶⁴ As we mentioned earlier, some writers such as Dawes (2009), pp128-131, contest this.

Conclusion

What we can see with Sober's and Norton's examples is that Swinburne's characterisation of simplicity does not accurately capture how scientists use simplicity. Judgments of simplicity often implicitly appeal to fit with background knowledge *k*, and Swinburne disregards *k* for the hypothesis of theism. Hence, there is no compelling reason to think that scientific usages of simplicity do support theism. Indeed, we even saw that some of Swinburne's characterisation of mathematical simplicity is incoherent.

Aside from the special cases like the Akaike Framework, which cannot apply to theism, we see that simplicity in science, is at most is a rubric, a pragmatic method we use to select which theories to *test* first, since simpler theories are easier to test; and there's nothing to say that background knowledge is necessarily likely to support any hypothesis even if it is simpler, or that simpler theories are more probable. Indeed, Riesch reports that many scientists, when interviewed, "[B]elieved Occam's razor to be a pragmatic choice that is only relevant to make the scientist's life easier, rather than either an integral part of scientific method or even a pointer to the theory that is more likely to be true." (2010, p87).

This is fatal to any claim Swinburne might have to being able to produce a P-inductive argument for theism, since simplicity was his last hope to fix the priors. If we cannot then fix the priors by an appeal to simplicity, nothing else can. And without a way to fix $P(h)$, no P-inductive argument can get off the ground.

Perhaps Swinburne has one possible reply. We have argued above on the assumption that the notion of simplicity that Swinburne is interested in, is the notion that is at play in the sciences. We have argued, as Swinburne does, that there is no general concept of simplicity. Yet where simplicity considerations are invoked in science, the concept cannot be employed in the cosmological argument for theism. This is because either the simplicity principle is pragmatic (not epistemic), or, because it appeals to background knowledge, which Swinburne denies we have in the case of the cosmological argument (2004, p66). Perhaps Swinburne can claim, however, that there is an *a priori* version of Occam's Razor which applies in cases where we have no background knowledge, and hence, the science examples given here are all irrelevant. So, perhaps because theism is simple, and because *a priori* we should just take the simplest theory, we should still favour theism. But we have seen no reason to believe there is any such principle to identify what the "most simple" theory is, or that it would have any justification. But let us indulge the idea in the next chapter. Let us then discuss whether theism is in fact simple.

Appendix to Chapter 5: Old Evidence and Background Knowledge

The following problem might have occurred to the reader, in the context of determining what data goes into e and what data goes into k , and whether perhaps Swinburne's e is in fact old evidence. Anything we know about already, has a probability of 1.0 of occurring, since it has already occurred. And so, if we assume that there is background knowledge of a physical universe, *qua* old evidence, it would follow that $P(e|k) = 1.0$. And, if $P(e|k) = 1.0$, it means that the denominator in Bayes' Theorem would be 1.0 as well, entailing that h would have no effect on raising $P(e)$. More technically, therefore, if $P(e|k)$ is 1.0, $P(e|h \& k)$ would also be 1.0. This means, again, that h failed to predict or raise the probability of e . In other words, h would be an irrelevant hypothesis, even if true.

Moreover, from Bayes' Theorem, it would also follow for the case of old evidence that $P(h|e) = P(h)$; that is, the hypothesis would be perfectly believable without evidence. The evidence would not help us believe, and the evidence would not be needed to support h . For the more we expect e , that is, the closer $P(e)$ gets to 1.0, the less value e has in supporting h (Christensen in Eells et al., 2000, p665). This means that if we know about an already-existing universe, and place it (or any propositions that presume that e exists) into k , we can't even get the cosmological argument off the ground, because h would have no effect on believing that our universe exists. A similar case is presented by the Anthropic Principle (AP), which we'll discuss briefly in Chapter 9.

Yet Swinburne doesn't seem to recognise 'old evidence' as a problem for his account, because he believes that $P(e) \ll 1.0$. He adds, "I have assumed that we have no contingent background knowledge (we have mere 'tautological' knowledge)" (2004, p148). This discussion suggests that, if we are to be able to make the cosmological argument at all, e is not to be put into background knowledge k . We have to *act* as if we didn't know that e was the case:

"My calling $P(e|h \& k)$ the 'predictive power' of h was not meant to imply that e was discovered only subsequent to the postulation of h that predicted it." (2004, p69).

The problem of old evidence also seems to also mean that generally speaking, the time *when* we learn e , determines our assessment of the probability of h . However, the time at which we learn about e should not affect our explanation of e . It seems irrational that if we already know e , that we cannot use it as evidence to support h (i.e. that we exclude e because it renders $P(e|h)$ as 1.0), and that consequently we have to seek new evidence (Christensen in Eells et al., 2000, p664, p667). Moreover, two pieces of evidence, e_1 and e_2 , both equally supporting h , should not be affected by the order of their mutual discovery. If e_1 was already

known about (e.g. The perihelion of Mercury), and strongly supports h , it doesn't mean that only the later discovered e_2 (e.g. bending of light during an eclipse), only supports h . Therefore, the evidence of this universe, even though it is known, old evidence, is nonetheless something in need of explanation, and stands as evidence towards theism.

Therefore, in order to be charitable to the theist, we should let him define the value of $P(e)$ from the Total Probability Rule [such that $P(e|k) = P(h|k)P(e|h \& k) + P(\sim h|k)P(e|\sim h \& k)$]. That is, we should pretend that we do not know that e is the case, and we act as if it may not exist. Thus we see that Swinburne treats the universe — all contingent things — as e , rather than k ; and indeed, the literature suggests that this is the best way one can respond to the problem of old evidence. The question then becomes one of how to obtain objective values for the likelihoods ($P(e|h)$ and $P(e|\sim h)$). We discuss that further in Chapter 8.

6. Is God Simple?

Introduction

So far, we have challenged the idea that there is a coherent way to defend Swinburne's claim that a simpler hypothesis has a higher prior probability; indeed, we've even challenged whether scientists generally prefer simpler hypotheses. For, to make his argument, Swinburne needs to show that not only is theism simple, but we should prefer the simplest hypothesis; that is, that it is more likely true.

In this chapter, we will temporarily set previous arguments aside and consider the separate question of whether God himself even simple, in response to the argument developed by Swinburne in our Chapter 4. The reader will recall that Swinburne presented us with three arguments: theism is simpler due to postulating (a) *one* person (Swinburne, 2001, pp85-7; p97), offering (b) *a personal* explanation (2004, pp35-8, 48-50, 80, 97), (c) with *infinite* properties (cf. Swinburne, 2004, p38-p43, p93 et seq., p97, p109, p152).

“[I]n postulating a person with infinite power the theist is postulating a person with the simplest kind of power possible.” (Swinburne, 2004, p97).

“The hypothesis of theism postulates not merely the simplest starting point of a personal explanation there could be... but the simplest starting point of explanation for the existence of the universe.” (2004, p106).

If theism is simpler, and if simpler theories are better predictors (cf. Sober, 2015, p141), it may well follow that for evidence *e* and theism *h*, $P(h)$ is high,⁶⁵ or $P(e|h)$ is high. However, if God is not simple, Swinburne's claim that $P(h)$ is high, due to theism's simplicity, would be false.⁶⁶

In this chapter, I will not respond to the claim that God is *quantitatively* simple due to being one entity. It seems to me that this is obviously correct. Likewise, I will not dispute the difference between personal explanations and causal explanations, that is, Swinburne's dubious remarks that personal explanations cannot be explained scientifically (*sic*, 2004, pp48-49), since I do not think that either of these claims impacts Swinburne's hypothesis. For, if we could explain personal explanations by means of reference to scientific

⁶⁵ If we assume, incorrectly as I have argued thus far, that a simpler theory has a higher prior probability.

⁶⁶ Whether $P(e|h)$ is high, will be discussed in Chapter 8.

phenomena, it would still be acceptable to claim that God offered a personal explanation. Since God is disembodied spirit, we naturally must recognise that God would not take a scientific explanation. And Swinburne discusses this at some length with reference to the work of Mackie (Mackie, 1982, p129; Swinburne, 2004, p107). Swinburne's response, that God does not require that kind of explanation, seems correct to me.⁶⁷ It seems to me, in this specific case, that whether personal explanations can be covered by scientific explanation is a matter for philosophy of mind, and that we can let the matter rest.

However, whether an infinite being is *qualitatively* simple, or whether *persons* are simple, are indeed worth discussing at this juncture, and the discussion does not require a commitment to physicalism. We start with an interesting deductive argument from the medieval scholars, namely, the Doctrine of Divine Simplicity.

I. The Doctrine of Divine Simplicity

We examine this doctrine because it might well support Swinburne's claim that God is simple, and because it has implications for our later arguments; even though the argument is deductive, and even though Swinburne doesn't make use of it himself. The reason is that the primary objection of this chapter relies on the notion that God can have many contingent properties or states. The Doctrine of Divine Simplicity denies this.

The Doctrine of Divine Simplicity (DDS) claims that God is not to be differentiated into separate properties. That is, God is inherently, intrinsically or qualitatively simple and has no contingent properties.

- “(1) God is not distinct from God's essence;
- (2) God's existence is not distinct from God's essence; and
- (3) God has no property distinct from God's essence.” (Wolterstoff, 1991, p532).

The following citation from Swinburne illustrates his understanding of this concept:

“... God possesses the properties described in some sense necessarily, and he is in some sense a necessary being. That is to say, God could not suddenly cease to be (for example) omnipotent. While God is God, he is omnipotent; nor could he cease to be God while remaining the same individual (as, for example, the Prime Minister can

⁶⁷ Indeed, it is question-begging against the theist for a physicalist to insist that God have physical explanations for his mind.

cease to be Prime Minister while remaining the same person)...” (Swinburne, 2004, p95).

God, on the DDS model, is an undifferentiated whole (Lamont, 1997, p526). Descartes, for example, tells us that

“The attributes which we include in the concept of the divine nature are so interconnected that it seems to us to be self-contradictory that any one of them should not belong to God” (in Cottingham et al., 1999, p107).

DDS, then, is the claim that God is nothing over and above his omnifarious properties. So, DDS also rejects the notion that God’s four omni-properties are in fact separate properties. God’s properties, according to DDS, are all just one (Lamont, 1997, p526, p528). So, God’s omnipotence just is his omniscience which just is his omnibenevolence which just is his omnipresence. God just is equal to *his* power and *his* knowledge and so on; they’re just aspects of one being (Plantinga in Lamont, 1997, p529). As we saw Swinburne argue earlier in the thesis, “God’s perfect goodness follows deductively from his omniscience and his perfect freedom,” (Swinburne, 2004, p99, cf. also p98, p105). So, it seems that even Swinburne, to a certain extent, has the notion of DDS in the back of his mind when he talks of God being simple.

When we moderns learn of this doctrine, we tend to react to it, as Wolterstorff says, with a sense of bafflement. Even Kant argues that we’re not equipped to comprehend it.⁶⁸ And so, we need to find some way to interpret DDS in our modern idiom.⁶⁹ One illustration of the idea that might render DDS intelligible to us, is a *triangle*. A triangle has three sides, three angles, whose sum is 180° on a flat plane. Without one of these properties (sides and angles), a triangle would cease to be a triangle. Having three sides (straight lines, joined at each end) just is to be a triangle, as is to have a set of three angles whose sum is 180° on a flat plane. Likewise, any figure which has only three angles, summing to 180°, will have three sides, joined, and will be a triangle. Thus, although having three angles is not the same as having three sides, the having of three angles summing to 180° entails having three sides, and being a triangle, and vice versa. The same applies to God.

⁶⁸ Kant, *Critique*, A636/B664, p586

⁶⁹ The answer, Wolterstorff urges us, is that we’re misunderstanding medieval ontology. We have two types of ontology at play here; our modern “relation ontology,” which sees objects as things that “have” properties, versus a medieval “constituent” style of ontology (Wolterstoff, 1991, p535, pp540-541). On the “constituent” ontology, God doesn’t “have” a nature or essence, he *is* that essence or nature, a “what-it-is-as-such” (Wolterstoff, 1991, p542).

Perhaps it will also help to refer to the familiar doctrine of the Trinity: God just is the Son, who just is the Ghost, who just is the Father. These three are one (Wolterstorff, 1991, p533, 534). Hence, it is not alien to us (albeit hard to understand), to suppose God could be in some sense a composite, and in some sense not a composite (i.e. be fundamentally simple). An analogy that apologists sometimes use for the Trinity is that of water; it is steam, liquid, and ice. It is three things, but it is one.⁷⁰

Difficulties for DDS

There are a number of ways to respond to the DDS that are offered in traditional philosophical and theological debates. For reasons of space, I do not wish to enter these criticisms in much detail. Rather what we do is consider criticisms that are relevant to my later argument.

The first criticism that I wish to highlight, from Patterson Brown, deals with the matter of whether God's existence is "derived" (contingent). In a sense, the DDS can be seen as a way to justify the Ontological Argument, or be drawn from it.⁷¹ Let's start with the claim that anything that has parts is "derived" or contingent; a composition. If God is necessarily one being, however, he is not derived or a composition. Yet, if God is not derived, then it seems that he must, in some sense, exist; since, if God does not have parts, he would not be "derived" from anything. And if God is underived (not contingent), then it follows that anything underived is ontologically necessary rather than contingent, since contingent things are derived from other things. So, if it is true that God's essence is underived, i.e. not made from parts, it does seem to follow that God necessarily exists. And presumably, this means that God is necessary, and has no accidental properties and is underived. But Brown objects:

"[T]he identity of God's essence and being, by no means implies that he actually exists, but only that his existence would be underived." (Brown, 1964, p89; also in Lamont, 1997, p532).

We should therefore instead question whether God is in fact "underived." For if God is contingent, as Swinburne notably tells us, this does seem to imply not only that God can fail to exist, but, that God might be complex, or composite, or "derived".

⁷⁰ For a thorough discussion, including arguments for and against DDS, the interested reader should see Wolterstorff (1991, op. cit.) and Lamont (1997, op. cit.)

⁷¹ DDS might also entail that the claim that "God exists" is a necessary truth (Aquinas in Lamont, 1997, p534). However, "... Aquinas explicitly rejected the idea of basing an ontological argument on the unity of God's essence and being." (Brown, 1964, p89). Whilst we know that Swinburne rejects the ontological argument (2004, p148), it is useful nonetheless to explain DDS because it supports Swinburne's position that God is inherently or qualitatively simple.

A second, related objection to DDS, which to my mind also has some force, is the objection from contingent properties.⁷² Consider, for example, “Loving John”, as a potential divine property. This certainly seems to be a contingent property, since I am contingent. Yet if God must only have necessary properties, it seems that God cannot have the property of “Loving John”. Yet, we believe that God, if he exists, has the property “Loving John”, therefore, it follows, God can have contingent properties. Furthermore, if there are other possible worlds, God must be identical in all of them, since he is perfect always. Yet, if God is willing, loving and continuously creating in all possible worlds, those worlds themselves should not differ, since his willings, lovings, and continuous creations, would be identical, if God has no accidental/contingent properties. Which means that unless God can have contingent properties, everything that exists or happens is in fact necessary, and nothing is contingent, and all possible worlds are identical. This means that there are no contingent states of affairs or counterfactuals. Since this seems to be an unreasonable position to hold, it seems more reasonable to hold that God has contingent properties. But if God has contingent properties, it seems that God is not simple in the sense intended by DDS. Having laid the groundwork, we can now explore this idea further by turning to the primary argument of this chapter.

II. The Divine Complexity Argument (DCA)

I now present my argument about why I believe that God is not, in fact, simple. Both Lewis (1973, p87) and Sober (1994, pp139-140) argue that quantitative parsimony does not really matter (it doesn’t really matter how many entities we posit). What matters, they argue, to make a theory plausible, is *qualitative* parsimony, that is, that the entities we propose to explain our observations should be in themselves, simple.

Consider the notion of *quantitative* simplicity, however. We say that fewer numbers of parts makes an entity simpler. An atom is more simple than a molecule, because it has only a few protons and electrons. And a molecule is simpler than a bacterium, because a molecule only has a few dozen protons and electrons, to the millions that constitute a bacterium. And a bacterium is simpler than more advanced life forms, such as humans, because a bacterium is one single cell, whereas advanced life-forms are multicellular (cf. Swinburne, 2004, p85). But we also think of a molecule as *qualitatively* more complex than an atom, because it has more parts, and we think of a bacterium as *qualitatively* more complex than a molecule, again, because it has more parts. That is, even though we have one molecule, and one bacterium (quantitatively, they could be said to be equally simple), we nonetheless think of

⁷² Lamont and Wolterstorff mention this objection. Wolterstorff, 1991, pp532-3, Plantinga, 1980, p47; Plantinga in Lamont, 1997, p528.

the bacterium as more complex *just because* it has more parts. In short, if a thing is quantitatively complex, we tend to think of it as qualitatively complex, too.

Now, before we get to the substance of the argument, the reader should also note the following comment from Swinburne, where he highlights the notion that God knows all facts in existence:

“God’s beliefs have a similar infinite quality... he would have all the knowledge that it is logically possible that a person have — that is, he would be omniscient.” (Swinburne, 2004, pp97-8).

With these two points in mind, we are ready to consider my argument. We start with a summary and then give the steps.

DCA: an omniscient omnipresent deity (h) is necessarily the most complex being in existence, as he contains, at least, thoughts of all n entities in the universe, if not all entities themselves,⁷³ and keeps n entities in existence. Therefore, if $P(h)$ is proportional to simplicity, or inversely proportional to complexity, $P(h)$ is maximally low.

1. God is omnipresent; he is of infinite extent [Swinburne, 2004, p94 et seq.]
2. Anything of infinite extent has no boundary [By definition]
3. Anything without a boundary has no body [2]
4. Therefore God is disembodied. [1; 2; 3]
5. If God lacks a body, he must be a mind or spirit, or not exist. [By definition of ‘spirit’]
6. God is a person. [2004, p88]
7. If God is a disembodied mind or person, then his mental states are his parts; i.e. persons are intricate because they have *many* states, beliefs, desires, etc. [Spirit and mind are the same: Swinburne, 2004, Chapter 9]
8. Let n represent the number of entities, particles and states in the universe. [Where n is the actual number]

⁷³ This claim here seems to imply that pantheism is true. The DCA is not committed to pantheism *per se*, however, it does seem true that if God is infinite and immanent (that is, he is within our space-time), that he must comprise (or contain) all entities within the universe. My understanding of traditional theism is that God is transcendent, that is, that he is not immanent, except on occasion such as in the person of Christ. However, DCA, as the reader will see, doesn’t depend on God being immanent. God merely needs to encompass all thoughts of all entities in the universe, for DCA to be true.

9. God is omniscient [2004, pp97-8], and God sustains the universe through *creatio continuans*.⁷⁴
10. Therefore God has a mental- or knowledge-state about every physical entity/state.
[9]
11. Therefore God has n mental- or intrinsic (or qualitative) states. [7; 8; 9; 10]
12. If there are n entities and states of entities in the universe, and n mental states of God about those entities and their states, and there is a God, then theism posits $2n+1$ states of being, to physicalism's n . [God is one being; DDS; 11]
13. $(2n+1) > n$ [12; mathematically true]
14. Therefore God/theism is maximally complex, at least twice as intricate as the universe.
15. Swinburne says that simplicity is the sign of the true [2004, p68]
16. Therefore physicalism is more likely true.

Such a Being is necessarily more complex than its creation, just as a potter is more complex than a pot. God must be more complex than his own creation in order to conceive and plan ahead for all the states of those entities. But if that's true, and if simplicity is the determiner of probability, God must be less probable than his own creation (Dawkins, 2006, pp136-143).

"If God knows everything, however, then all those bits of information must be stored in God, so God's simplicity would therefore seem to be a simplicity of name only, rather as 'uncomputable real number' is a simple name of a set of very complex entities." (Howson, 2011, pp126-7).

God must therefore be the *most* complex possible being, in dire need of explanation (Dawkins in Huberman, 2007, p84; Dawkins, 2006, p155, p149). Therefore, if prior probability is determined by complexity, $P(h) \approx 1/n$. This is quite the opposite to Swinburne's usual claim. However, we'll see a bit later on (in Chapter 7), it may be possible for Swinburne to mount an effective cosmological argument even if God is improbable.

⁷⁴ *Creatio Continuans* is the doctrine that God sustains existence by his thoughts. "If God is a being who by his intention at each moment of time keeps himself in existence at the following moment, then his existence at a given moment, which provides part of a complete explanation of some mundane phenomenon, would itself have a further explanation in terms of his earlier intentions... his existence for some beginningless period of time and his intention at each moment of existence to continue to exist would provide an ultimate explanation of those phenomena." (Swinburne, 2004, p80).

Objections to DCA

Objection i. A universe must exist first before DCA follows. One might argue that God is only n complex when a universe exists, since he would only then have n thoughts. Thus, it may be argued, God is not always n complex. This argument would work, however, it would only do so if God never contemplated anything. As soon as God contemplates a universe of any size or detail (whether it yet exists or not), then his thoughts instantly become as complex as that universe. Since God is omniscient and presumably at any time knows the future of the universe he will create, and the future states of particles in that universe, God is always at least n complex even if the universe doesn't yet exist, since he has a Divine Plan.

Objection ii. The mental is unified; mental states aren't parts.⁷⁵ DCA depends on a kind of philosophy-of-mind assumption that mental states are somehow separate entities, or that the mind is somehow fragmented, much as is proposed in Dennett's "multiple drafts" model (Dennett and Kinsbourne, 1992). Why could God's mind not be just one intricate state? For example, I can have a mental state about a set of items; yet I have one mental state. Therefore states with varied contents need not be more than one state. This rebuttal seems compelling at first. We are fairly sure that our "mind's eye" contains many objects, yet we don't believe that this represents our having many different mental states or objects.

But even if God had a single unified mind, he'd still have an n -complex state in his mind. And that is sufficient to make him at least n -complex intrinsically (or qualitatively). A single entity which has one n -complex state is still an n -complex entity. And if there is a universe of complexity n , and a God of complexity n , it still follows that God is $2n+1$ complex. Moreover, there's no reason to say that placing God's thoughts into a set, "God's thoughts", makes God's thoughts one entity. Just as there being a set of dogs does not mean there is only one thing — the set "dogs" — as soon as one conceives of the set of all dogs. The matter of dogs is still complex; there are many breeds, of many different sizes.

While we can well imagine a "thing" made of parts, like a car, and say it is "one thing", we don't go to these lengths to deny that the car is made of parts; we still call it a car ("God's mind"), but we don't deny it has parts ("mental states"). We just admit that a car has parts, many thousands, in fact, and that it's complex. Thus, any entity (spiritual or physical) which has parts, is complex.

Objection iii. Craig's argument against divine denumerability. Craig tries to distinguish between denumerable infinities and infinite extents. Craig tells us that the infinity that

⁷⁵ Walmsely, G., 2011, personal communication

comprises God is not denumerable; that is, it does not have infinite numbers of smaller parts. Hence, DCA, which argues that God comprises n denumerable parts, is false. And this seems to imply that God is, in the medieval DDS sense, simple, in the sense of lacking parts. Let's see how this argument works.

Craig argues, first, that God's infinity is not meant in the same sense as the mathematical sense of "infinity", that is, it does not refer to an infinite number of denumerable parts or elements. Instead, God's infinity is "qualitative"; it means something more like that God is metaphysically necessary, has the omni-properties, etc. So, in this case, "infinity" is an "umbrella term" to cover God's maximal features. Omniscience does not involve knowing an infinite number of thoughts, and omnipotence does not mean being able to do an infinite number of things. Rather, when we say that God is omniscient, Craig argues, we are *not* really just saying he knows all true propositions; we're talking about, instead, an "undivided intuition of [all] reality". Thus, the number of propositions God might know about, is at most only hypothetically infinite. Craig concludes, then, that God's infinity is not susceptible to a quantitative analysis. It is just "inapplicable".⁷⁶

I do not believe Craig's argument succeeds. It seems to me that if God is contemplating the lives of all of earth's 7.2 billion inhabitants, that he must have 7.2 billion mental states or belief states; one per person, at least. To say that God's 'intuition of reality' is 'undivided' is purely dogmatic or *ad hoc*. He can still have a belief state about me, an anger state about a sinner, a love state about a person deserving his love, etc.

What makes our phenomenology surprising is that it seems unified, but in fact, we can distinguish separate objects in it, because there are, we assume, separate objects in the real world, which the mental states, in some way, represent. So, because the objects in the world are separated and separable, they create separate states in the mind. The thoughts that an adult has just are more complex than the thoughts that a baby has, because an adult's thoughts are more numerous and detailed, considering many more scenarios, sensations and possibilities. So much greater then, must be the complexity of God's thoughts.

Objection v. Pragmatic limits on omniscience. Now, perhaps God could know formulae or laws, instead of all n states, and, as is posited in the doctrine of Deism, God could merely have created the laws of the universe, and then "sat back" to let the universe take its course.⁷⁷ Hence, God's omniscience would not be a case of knowing the dealings of every of the n

⁷⁶ Craig, W. L (2009). <http://www.reasonablefaith.org/is-god-actually-infinite> -- Accessed July 2015.

Interestingly, Craig denies the doctrine of DDS (elsewhere on his site), but his support of the doctrine of God's actual non-denumerable infinity is compatible with, and necessary for the defence of, DDS. DDS requires that God is not denumerable. The reader should note that Craig is a well-published author and the site cited above is his site where he places his research and public arguments.

⁷⁷ Pitman, M., 2011, personal communication

entities, but rather, it would be the case that God simply knows in a predictive sense, or instrumentalist sense, what will happen with any scenario he contemplates, because he knows his own laws. Suppose, further, that God knows what people are like, generally. It seems to follow, then, that he wouldn't have to know what each of us are doing, thinking or planning every day, as long as he just knows what we're like.

But if this were true, it would seem to strip God of real omniscience. Even worse, God would not know what I have done, as a member of earth's 7.2 billion people, if he's not keeping track of all my activities. We, as mere mortals, know what people are likely to do, and with research into sociology, crowd behaviour, economics, etc., we can reasonably predict what people will do, because we know what they're like. If this is the kind of omniscience God has, he's not much smarter than us. Thus, God has to know about all *n* entities if he is to be omniscient.

Objection vi. God's omniscience is restricted to Forms or properties.⁷⁸ Suppose God knows facts about the universe as something akin to Platonic Forms, or as general properties (or sets, again), rather than as discreta. Suppose, for example, that God just knows generalities, like the Perfect Triangle, the Good, etc. If this is true, then God would not have to have *n* mental states or "ideas".

But again, this would also seem to fly in the face of traditional theological claims that God knows everything. And even worse, this proposal strips God of the power of *creatio continuans*, since he is no longer contemplating every particle in the universe. For *creatio continuans* requires that God constantly contemplate the existence of everything in the universe.

Objection vii. Mental states are contingent properties, therefore they're not part of God. A theist could argue that thoughts about the universe, and of humans, are contingent or accidental. These thoughts are not necessary properties of God. And therefore, all contingent states, on which the DCA is based, are not part of God. And if these contingent properties or states are not parts of God, he is therefore not a composite. God only comprises his necessary properties, the omni-properties, as we saw in DDS. Indeed, we can argue that God's contingent "properties" are not so much properties, as mental acts.⁷⁹

This seems correct. However, I have not claimed that God is composite because he has *n* accidental *properties* (thoughts of me, the universe, this electron, that proton), or because he performs *n* mental acts. Instead, my argument is that God is a disembodied mind; and a mind only comprises mental states; God has *n* mental states; therefore, God's very

⁷⁸ Allsobrook, C. 2011, personal communication

⁷⁹ Plantinga (in Wolterstoff, 1991, p536) offers a similar response.

essence is *nothing but* the collection of n mental states that he has, including, presumably, thoughts of his own existence, and some infinite power to cause things immediately (without mediation). We can grant omnifarious properties to God as much as we like; it doesn't take away the fact that, if he's omniscient and omnipresent, he must have an infinite number of contemplative states encompassing everything he knows. This is particularly true if the theist accepts *creatio continuans*, because then, certainly, every part of the universe is in God's mind and kept in existence by it.

Objection viii. God is not *qualitatively* complex; yet DCA only shows *quantitative* complexity. Another objection that could be raised is that God is at most *quantitatively* complex on the DCA argument. And we've seen Sober (1994, op. cit.) argue that quantitative complexity is not an adequate objection. In other words, God is not qualitatively complex, *contra* my argument above. So, since DCA tries to show that God has many internal states, it is an argument from *quantitative* complexity. God is not qualitatively complex even if he is quantitatively complex.⁸⁰

Here's my response. Firstly, the DCA seeks to show that God has n internal states (*quantitatively*), and, like a human, he is therefore *qualitatively* complex, because he has many internal states. He is, as I said above, intricate. We do not think of a Fabergé egg as qualitatively simple, for the reason that it has many small parts, jewels, etc.; hence, a Fabergé egg is *qualitatively* complex *because* it is *quantitatively* complex. The same applies to an omniscient God. The point being made is that there are so many entities in the universe (molecules, DNA strands, cells, micro-organisms, people, planets, etc.) that merely knowing about all of them *de facto* makes God the most complex being in existence. Think, as another analogy, of a baby. A baby is a less complex person than an adult, despite having similar physiology, just because a baby has few experiences, memories, ideas, etc. Hence, the more thoughts, ideas, etc., a being has, the more complex it is.

Secondly, on the question of quantitative complexity being problematic. I am not sure that Sober's (and Lewis') objections here actually work in the case of DCA. Sober's (and Lewis') complaint, is specifically against Occam's Razor. Their argument is that we should prefer a hypothesis that explains well, even if it has more entities. But their injunction against relying on Occam's Razor is, I think, a *ceteris paribus* type of objection (that is, use it if you have no other criterion to choose between hypotheses).

DCA, moreover, makes *no* claims about whether God is a good explanation or not. DCA is also agnostic as to whether simple explanations are desirable or not. DCA is *just* the claim that God is qualitatively complex, because he is a mind comprising vast quantities of

⁸⁰ Bishop, in review of this thesis, 2015, raises this objection to my argument.

mental states about the universe. Now, we know that Swinburne rejects polytheism in favour of monotheism mostly on the grounds that polytheism is *quantitatively* complex (2004, p147). So, if Swinburne insists that *ceteris paribus*, we should prefer simpler explanations, it follows that Swinburne should, by his own lights, reject theism, as a non-simple explanation, due to quantitative complexity too.

III. Persons are not simple

Think back now to Swinburne's oft-repeated remark that God offers a simple explanation because he is a person (2004, pp48-51, pp63-5, pp88-9, p97, pp107-8, p334).

Whilst we can recognise that a personal *explanation* seems simple *prima facie*, we don't just take peoples' actions at face value. We often ask *why* a person did this or that. And that takes us back to the nature of the person, how they make decisions, and what their reasons are. Contrary to Swinburne's remarks, persons are not simple because persons have many thoughts, plans, intentions, memories, ideas, reasons, etc., as argued above. In God's case, he has the maximum number of ideas. *Even if* it is true that we cannot explain personal actions by reference to scientific theories, for the various reasons given by in Plantinga (in Plantinga and Tooley, 2008, pp20-25) and in Swinburne (2004, pp35-7, 38, 48-9), persons are still complex, and that is all that we need to get the DCA argument through.⁸¹

Persons, we simply need to argue, are often quite inscrutable, and indeed, the inscrutability of God's reasons is why we cannot easily explain evil under theism. The theist tacitly admits this when he responds to the problem of evil, or appeals to the hiddenness of God. Persons' mental states require prior explanations, or they are just brute facts. In the case of a person S, when S performs some action A, we ask *why did S perform A?* We are not satisfied, generally, with an answer "because S chose to." We want to know S's reasons. This is not to raise the argument that the cosmological explanation regresses; it's just to show that God is complex, and hence inscrutable.

Whilst the theist might try appeal to "*complete* explanations", that is, that God's personal choices offers a *complete* explanation (an explanation beyond which there are no further explanations, like a roulette wheel that just happens to land on a number) (2004, p78, p80), the physicalist need not accept this position.⁸² For it is just offering a competing brute fact, with a very expensive ontological commitment — an infinite God.

⁸¹ The same applies, as we will see later, when discussing the cosmological argument in full in Chapter 8; "Why did God want to create *this* world?". But let us not pre-empt that discussion.

⁸² "His [God's] power is not dependent on brain or nerves. His intentions are immediately operative—because that is how things ultimately are." (2004, p107).

Furthermore, returning to the matter of God's choices and reasons; whilst theists generally take it that God could make any good world, we generally believe that God chose this universe for antecedent reasons.⁸³ Of course, a theist could deny that there's a causal sequence in God's reasons and thoughts, since they're libertarian-free. However, that would then suggest that God's choices were spurious or random; yet God is spoken of as acting for reasons.

"A mental world (or universe of ideas) stands in as much need of a cause as does a material world (or universe of objects)..." (Hume, *Dialogues Concerning Natural Religion*, part 4).

This, then, means that God cannot be the starting point of explanation, for the simple reason that he would be the kind of thing that needs explanation (Dawkins, 2006, p149). This is not to make a simplistic claim that we have to have an explanation for our explanations. Just as, for example, we can explain the cosmic background radiation by reference to the big bang (and have no explanation for the big bang), so we can explain the universe (or the big bang) by reference to God, and not need to explain God. However, this brings us back to Swinburne's comments on *ultimate* explanations. Remember in the Introduction we said that Swinburne provides a hierarchy of types of explanations; namely, *Full*, *Complete*, *Ultimate*, and *Absolute* explanations. A *full* explanation merely gives the most recent necessary and sufficient conditions for an event (2004, p76). A *complete* explanation is a *full* explanation for which the causal factors themselves do not have explanations (2004, p78). An *ultimate* explanation is a *complete* explanation for which we have a first cause for which we have no explanation; it is a brute fact (2004, p78). God, for Swinburne, is an explanation of this sort. If we want to use God to explain the universe, then, God must be more than just a *full* explanation (in Swinburne's technical sense, and in the sense that the Big Bang is a full explanation). God must be an *ultimate* explanation. Yet, if God has many mental states, he cannot be an *ultimate* explanation, since we could presumably account for God's reasons and mental states by reference to further explanations, such as morality (that God saw it "was good").

This is also not to repeat Mackie's argument that we need an explanation for the mechanism of God's choices (Mackie, 1982, p129),⁸⁴ The requirement here is much milder. All that is asked of the theist is that he admits that God has reasons for his actions, that is, a "divine plan". As Swinburne says, "[God] cannot just act. He must act for a purpose and see

⁸³ Again, we will avoid going into the cosmological argument in much detail here as this discussion is carried over to Chapter 8.

⁸⁴ Objected to by Swinburne on p107, cited above.

his action in some way as a good thing.” (Swinburne, 2004, pp100-1). And if God has a plan, or reasons, it suggests that he has, for n entities, n plans or reasons; and is therefore complex.

Conclusion

It seems quite possible to imagine an omniscient or omnipotent but not omnibenevolent being, without fear of overt logical contradiction: “It seems coherent to suppose that there exists a complex physical universe but no God, from which it follows that it is coherent to suppose that there exists no God” (Swinburne, 2004, p148). And if this is logically possible, it seems to follow that God’s properties are not logically necessary properties or equivalent to each other, as Swinburne himself recognises. Furthermore, since God can think of me, and since God can therefore have contingent properties, it follows again that not all of God’s properties are necessary properties. If God contains, or comprises any contingent states, then it seems to follow that he is complex and contingent himself, since he must comprise all states in the universe, *qua* omniscient and omnipresent.

We saw that God is not *intrinsically (or qualitatively)* simple, since he has almost infinite accidental states, which he must, *qua* omniscient. If there are n entities in the universe, and God is omniscient and omnipresent, God has n contingent mental states, he is therefore n -complex. For, were God’s thoughts simple, they’d presumably be simple to understand, and we’d understand why, for example, evil existed.

If we reject this point — that God can have contingent properties — then God could not discern between sinners and saints, and yet theists believe he can. Furthermore, alternative possible worlds and counterfactuals would be impossible if all of God’s states, including his beliefs, are necessary.

Furthermore, we saw that if God is a person, and persons are intricate, then God is intricate. Even if personal explanations are simpler, and even if we can’t reduce personal explanations to scientific explanations, these points are moot. The very fact that theists are offering a personal explanation means that these explanations are intricate because they originate in an inscrutable person — which we’ll discuss further in Chapter 11.

Therefore, we must conclude, God is not simple, and cannot be. And if that’s true, *and* if theism’s prior probability depends on divine simplicity, it means that theism has a low prior.

7. Gwiazda's Argument

Introduction

In the previous chapters, we have discussed how Swinburne develops arguments from divine simplicity to bolster his case that $P(h)$ is high. We have repudiated those claims thus far. We have rejected the ideas that $P(h)$ is high, that theism is simple, and that $P(h)$ for theism is high because theism is simple.

We now start to consider the other terms of Bayes Theorem, namely $P(elh)$ and $P(e)$. In this chapter, we consider an argument from Gwiazda which shows that there are limits on the ratio of the likelihood $P(elh)$ to the priors. Given these limits, we conclude that either theism is not at all probable *a priori* ($P(h)$), or, that theism is just not a useful explanation, because the likelihood is not high ($P(elh)$), or that the universe is not as improbable *a priori* — $P(e)$ — as the theist may believe. Any one of these being true represents a serious problem for Swinburne; yet at least one of these is necessarily true because of the mathematics of Bayes' Theorem combined with Swinburne's claim that our universe is *a priori* improbable. In this chapter, then, we aim to show that Swinburne cannot have a P-inductive argument for theism. In the chapter after this, we will turn to considering Swinburne's C-inductive cosmological argument for the claim that $P(elh)$ is high; we do not directly address that argument here.

The Complexity Quotient

We start with an argument from Gwiazda. Following Gwiazda, suppose we take W as the claim 'one wooden block exists'. And suppose we recognise that the wooden block could have a variety of shapes and colours, namely: w_1 = "one small light wooden block exists"; w_2 = "one large light wooden block exists"; w_3 = "one small dark wooden block exists"; w_4 = "one large dark wooden block exists". Let's assume that these versions of W are equiprobable. Thus the probability of W being any particular one of $w_{1...4}$ is given by

$$P(W|k) = 4 \times P(w_i|k)$$

Which implies that

$$P(W|k) / Pr(w_i|k) = 4 \text{ (Gwiazda, 2009, p368).}$$

Gwiazda calls the quotient $P(h|k)/P(e|k)$ “the complexity quotient”: how complex a hypothesis h is, is a measure of its probability over the probability of the evidence that it is meant to explain.

“ h , according to Swinburne, is the simplest hypothesis imaginable.”⁸⁵ Thus $P(h|k)$ is far greater than $P(e|k)$.” (Gwiazda, 2009, p360).

Remember, now, that the value of $P(e|k)$ has to be $\geq P(e|h \& k) \times P(h|k)$ to ensure that the posterior probability is never greater than one. And we know that the posterior probability $P(h|e \& k)$ cannot be more than [1.0]. Thus, substituting 1.0 for $P(h|e \& k)$ and Swinburne’s test value of [0.5] for $P(e|h \& k)$ (Swinburne, 2004, pp338-9), Gwiazda finds the following result:

$P(h e \& k)$	$= P(e h \& k) P(h k) / P(e k)$	
1	$\geq P(e h \& k) P(h k) / P(e k)$	[As argued in the paragraph above]
1	$\geq (0.5) P(h k) / P(e k)$	[Swinburne, 2004, pp338-9]
2×1	$\geq 2 \times (0.5) P(h k) / P(e k)$	[Multiplying throughout by 2]
2	$\geq P(h k) / P(e k)$	

From this, we can derive:

$$2 \times P(e|k) \geq P(h|k)$$

Which means that h has a maximum prior probability of double that of the universe, $P(e)$. But if theism is twice as probable as the universe, it seems to not be that simple, since the universe is very complex, and Swinburne is tying complexity to improbability. Swinburne claims, in short, that the universe is vastly improbable, and therefore unlikely to exist without God. Now, if Gwiazda has shown that $2P(e) \geq P(h)$, it means that theism is also vastly improbable. Let’s take a number. Suppose $P(e) = 0.00001$. That means that, mathematically speaking, $P(h)$ is at most 0.00002 which is not what Swinburne wants; he claims that $P(h)$ is high. That is, if $P(h)$ is high when h is simple, it follows that $P(h)$ is very low if theism is only twice as simple as the universe. If the universe is vastly improbable, it means, by Bayes’ Theorem, that theism is also quite improbable, *a priori*. Yet we’d expect the ratio of probability to be much higher than 2 if theism is probable *a priori*, and we’d not expect $P(h)$ to be at most $2P(e)$, from the way Swinburne describes it.⁸⁶

⁸⁵ q.v. Swinburne, 2004, p336

⁸⁶ This is not to say that a cosmological argument which merely *raises* the probability of theism, is ruled out.

“The complexity quotient $P(h|e)/P(e|h)$ should be a large number given Swinburne’s claims regarding the simplicity of h and the complexity of e ... Put loosely, great complexity is not likely to spring forth from great simplicity.” (Gwiazda, 2009, pp360-1).

In short, Gwiazda is arguing that because of Bayes’ Theorem, and because the universe is supposedly complex, we cannot expect this complex universe to arise from an infinitely simple deity.

The important point to note, then, is this. Swinburne has argued that the greater the simplicity of the hypothesis, the higher the probability, and hence according to him, $P(h) \gg P(e)$. Yet what Gwiazda’s argument shows is that if we think $P(e|h)$ is reasonably high, this is *incoherent* with theism having a high $P(h)$, and *vice versa*. But the reason for this is not difficult to see; for the value of $P(h)$ is constrained by the TPR on pain of incoherence.⁸⁷ Hence:

$$P(e) = P(h).P(e|h) + P(\sim h)P(e/\sim h), \text{ so}$$

$$P(e) \geq P(h).P(e/\sim h)$$

And so we see that adding Swinburne’s test value of 0.5 for $P(e|h)$, we get Gwiazda’s result. Thus we can see that the following triad of claims is incoherent:

1. $P(e)$ is low
2. $P(h)$ is high
3. $P(e|h)$ is high.

And yet it seems that Swinburne is committed to all three of these claims, since he wishes to argue that the simpler the hypothesis, the more probable it is (Claim 2). According to Swinburne, God is simple (so $P(h)$ is high, (Claim 2)); the universe is complex (so $P(e)$ is low, (Claim 1)); and, God is a simple explanation of the universe and we expect a universe

⁸⁷ Bishop in his initial report on the thesis remarks that “ $P(e|h)$ is the prior probability that e obtains *in any case*, whether or not the hypothesis h obtains”. That is true in a sense, but as the TPR makes clear, in order to find a value for $P(e|h)$ we must supply the probabilities of whether or not h obtains and combining them with the relevant likelihoods. More intuitively, we can say that I must take into account how likely h is in evaluating $P(e)$ given I think e and h are not probabilistically independent. The problem is in this case, we simply do not have a base-rate frequency that we can plug into $P(e)$. I thank my examiner for helping me to be clearer.

like this one if theism is true (so $P(e|h)$ is high, (Claim 3)).⁸⁸ Yet if these claims are incoherent, Swinburne has to abandon one of these claims.

Put it another way: if $P(e)$ is very low, because our universe coming to exist is highly improbable, then $P(h)$ or $P(e|h)$ must be low as well, of mathematical necessity, to get a value in the range $[0;1]$ for $P(h|e)$. Swinburne's basic premise for his cosmological argument is that $P(e)$ is low, which as we mentioned, the atheist accepts. And yet as long as Swinburne thinks our universe is vastly improbable, then either $P(h)$ or $P(e|h)$ must be very low too; that is, either theism is vastly improbable *a priori* or theism is a poor explanation.

But the second thing we should note with regards to Gwiazda's argument is that it shows that the prior probability of God's existence can be very low and yet we still might have a very compelling, P-inductive argument for the existence of God. This is because even if $P(h)$ is low, we can still have a high $P(e|h)$, if $P(e)$ is comparably low. It is compatible with a low $P(e)$ and value of $P(e|h) = 0.5$, for example, that the value of $P(h|e)$ could be 1.0. How is that possible? Well as we can see from TPR, if $P(e|\sim h)$ is zero, that is, if the evidence would be inexplicable without h , then $P(h|e)$ will automatically equal 1.0; that is, theism would be true. More generally, then, if $P(e|h) \gg P(e|\sim h)$ then e will strongly confirm h . Consider the following remark from Swinburne which recognises this:

“[Given] $P(e|k) = P(e|h \& k) P(h|k) + P(e|\sim h \& k) (P(\sim h|k))$ [TPR].

The first conjunct on the right-hand side ($P(e|h \& k)P(h|k)$) simply repeats the top line of the right-hand side of Bayes's theorem. So by the theorem $P(h|e \& k)$ will be close to 1 if and only if the second conjunct ($P(e|\sim h \& k)P(\sim h|k)$) is low (relative to the first conjunct).” (2004, p72, [my inserts]).

Given both of these points, perhaps the most charitable way to interpret Swinburne, his oft-repeated mantra notwithstanding, is not to think of him as committed to the argument that $P(h)$ must be high because God is simple.⁸⁹ Instead, we can hope that Swinburne is really concerned to argue that $P(e|h)$ is high; much higher than $P(e|\sim h)$; in other words, that theism is a good explanation. Consider this quote where Swinburne entertains the idea that $P(h)$ might be low:

⁸⁸ We will discuss Swinburne's reasons for this claim, that theism explains this universe, in the next chapter.

⁸⁹ It is relatively clear that Swinburne does think that $P(h|k)$ is high: “So then theism has very considerable simplicity. Simplicity is the major determinant of intrinsic probability.” (Swinburne, 2004, p108). “The intrinsic probability of theism is, relative to other hypotheses about what there is, very high, because of the great simplicity of the hypothesis of theism.” (p109). “The major determinant of the intrinsic probability of h was its simplicity.” (p111).

“If, as I suggested, $P(h|k)$ might be very small (so improbable is it *a priori* that there should exist anything at all), $P(\sim h|k)$ may be very large.” (Swinburne, 2004, p112).

It is the *likelihoods*, therefore, which should be doing all the confirmational heavy-lifting. In the next chapter we will turn to consider whether Swinburne has any compelling arguments to motivate the claim that $P(elh) \gg P(el\sim h)$, that is, a C-inductive argument. However, before we move along to that discussion, let’s briefly see what happens if we consider the PITI inequality again.

PITI

It is worth emphasising that none of the remarks above about the central importance of the likelihoods help reduce the concerns raised in previous chapters about the need for a value for $P(h)$. As we saw, if we are to generate a successful P-inductive argument, we need a clear value for $P(h)$. To see this point, consider the following modification to Gwiazda’s presentation. Consider a case where $P(h|e) = P(\sim h|e) = 0.5$, that is, that the evidence does not support the hypothesis any more than the denial of the hypothesis. In such a case we can see from Bayes’s theorem that:

$$P(h).P(elh) = P(\sim h).P(el\sim h)$$

From this, it follows that

$$P(h|e) > P(\sim h|e) \text{ iff } P(h).P(elh) > P(\sim h).P(el\sim h).$$

As we saw earlier, in Chapter 2, this is an inequality that Swinburne has to meet. We called this the P-inductive Threshold Inequality (**PITI**). Moreover, even if Swinburne or any theist can establish that $P(elh) \gg P(el\sim h)$, that is, that a C-inductive argument for theism is possible, this result will only help establish a P-inductive argument if $P(h)/P(\sim h) > P(el\sim h)/P(elh)$, from **PITI** above.

If the reader can agree that there is no principled way to fix $P(h)$, as we argued in previous chapters is the case with theism, then there can be no grounds for thinking that inequality is ever satisfied, as $P(h)/P(\sim h)$ would be undefined. This conclusively establishes that there can be no P-inductive cosmological argument of the form of Swinburne’s argument, unless there is evidence which is strictly incompatible with atheism (and all the other alternatives to theism), such as, perhaps, direct manifestation of the God of restricted theism.

Conclusion

This chapter has shown, firstly, that either the likelihood ($P(e|h)$) is not high, or the universe is not as improbable *a priori* ($P(e)$) as the theist may believe, or the prior probability $P(h)$ is very low (at most, $2P(e)$). Which means that there appears to be something wrong with Swinburne's views on simplicity: either theism doesn't explain simply, or our universe is simple, or theism is complex, or perhaps most probably, as we argued earlier, there isn't the connection between simplicity and probability that Swinburne believes.

Secondly, the chapter has shown that because there is no way to fix $P(h)$, no P-inductive argument for theism is possible, unless evidence strongly incompatible with atheism is found. These two conclusions show that Swinburne cannot get the result that he wants from Bayes' Theorem. Granted, Swinburne has never claimed that he had a P-inductive argument from cosmology; it was we who proposed that, given his strong claims for the *a priori* plausibility of theism, and his strong claims for the improbability of our universe arising, that were he able to show that God would likely make this universe, that would likely be the best case that could be made for a P-inductive argument. We now see that this cannot be done, but the problem is general. Even if we were to agree that there were further arguments that supported theism, without a way to fix $P(h)$ even approximately, it can never be established that they are P-inductive.⁹⁰

So, given that we can't get a P-inductive argument from cosmology, what we should now consider is whether there is a plausible C-inductive version of Swinburne's argument, since after all, Swinburne thinks that that is what he has on hand. So we must now consider how to evaluate $P(e|h)$ and $P(e|\sim h)$.

⁹⁰ Allowing for the same proviso as above that there is no evidence strictly incompatible with atheism or more than likely something which is incompatible with atheism.

8. Is theism a good explanation?

Introduction

In this chapter, we will address the final terms of Bayes' Theorem as used by Swinburne's cosmological argument, that is, for the evidence of our universe e , we decide whether $P(e|h) > P(e|\sim h)$; what we earlier called the **CITI** inequality (in Chapter 2). We will offer two types of argument against this view; which we will call the **No-Creation Arguments** and the **Divine Indeterminacy** argument, respectively. Then, in the closing section, we will briefly turn to consider how we might fix the prior probability of our universe existing ($P(e)$), to determine whether it is in fact low, and in need of explanation.⁹¹

What makes an hypothesis “good”?

We will take it that a good hypothesis has two important features: prediction, or what I will call “usefulness,” and evidential fit. A hypothesis, as we will explain below, is *useful* if it leads us to expect future data, that is, if it has instrumental value, it predicts (Swinburne, 2004, p30).⁹² A theory or hypothesis is a good explanation, then, if the hypothesis *fits* the evidence in a *simple* way (Swinburne, 1997, p24; 2001, p88, p95) and if the hypothesis is coherent with (fits) existing knowledge k and other theories (2001, p95; Swinburne, 1997, p53; 2004, p68). That is, if evidence e is expected on h , given background knowledge k , then h fits e . In Bayesian terms, “fit” just is just the claim that $P(e|h)$ is *non-zero*. Whereas “explanation” provides us with grounds for thinking the evidence is likely in light of the hypothesis, i.e. that $P(e|h)$ is *high*.

“The all-important point to be made at this stage is, however, that it is the criterion of simplicity that determines which proposed theory ‘fits best’ with those neighbouring hypotheses. ‘Fitting better’ is ‘fitting more simply’, and thus making for a simpler overall view of the world. The requirement of simplicity thus involves the requirement of coherence in our belief system, on which coherence theories of justification (and knowledge) rightly insist.” (Swinburne, 2001, p95).

⁹¹ The connection here between $P(e)$, $P(e|h)$ and $P(e|\sim h)$ is obviously through the TPR equation. What is important, then, in assessing $P(e)$, is the likelihood ratios (Swinburne, 2004, p112).

⁹² See also Howson, 2011, p129 and Swinburne, 2004, pp56-7, p65 for characterisations of scientific explanation as prediction.

We can see from inspection of Bayes' Theorem that if evidence, e , is to confirm a hypothesis h then $P(e|h) > P(e)$. Consider the example of light bending around a star (gravitational lensing) again. Gravitational lensing would be surprising if the Theory of General Relativity (GR) were not a good explanation. So, where e_L is gravitational lensing and h_{GR} is General Relativity, $P(e_L|h_{GR}) > P(e_L)$.

But it's important to point out that even a high $P(e|h)$ does not indicate that h necessarily explains e . Bayes' Theorem merely deals with the probability measure how expected evidence is on that hypothesis (Sober, 1994, pp139-140). For example, we may know that there is a strong correlation between two variables without being able to explain why. If we have good grounds for thinking a correlation holds, then that can inform the relevant likelihoods. So, let's identify the hypothesis that $(2H_2 + O_2 \rightarrow 2H_2O)$ by the letter W . W may correlate strongly with evidence e that we have water being formed; in such a case; so when we say $P(e|W)$ is high, we think that W explains e . In the special case of theism, however, no such correlations are available. Hence, Swinburne argues, the better and in some sense the simpler explanation of the evidence, theism, ought to be given a higher probability than its rivals. Such a claim is not uncontentious, as we have discussed at length, but rather than engage those controversies again, we will assume that there is something right about the idea that good explanation implies high likelihood ($P(e|h)$). So what we in effect investigate in this chapter, is whether we think theism could explain the evidence. Whether relevant rivals, such as multiverse theory, are to be preferred, is something we discuss in the subsequent chapters (9-10).

Prediction versus Retrodiction

Before we enter Swinburne's cosmological argument for theism proper, we should draw a distinction between what I'd like to call *retrodictive* explanation, which we also call "abduction", and *predictive* explanation, which is a form of induction. *Retrodictive* explanation seeks to explain phenomena in the past; known data, "old evidence", data already observed. Retrodictive explanations refer to known theories, which say that, given this theory (h), we know why we observed the evidence (e), because of the mechanism described in (h), which explains it. So, for example, given that we just saw an explosion and the creation of water vapour, (H_2O), we can say, retrodictively, that most likely, someone heated hydrogen in the presence of oxygen, that is, W is true. Of course, alternative explanations are possible; we may have witnessed the combustion of methane (CH_4) in oxygen, too. Thus, what is meant by a "retrodictive" explanation is that it refers to the best explanation for an already-observed phenomenon (the one that fits best with our existing k). An example that is relevant

here is the universe; theists seek to explain the already-observed phenomenon of a life-capable universe by reference to what they deem the best explanation: God.

By contrast, *predictive* or inductive explanation is about the future. So, we say, we are just about to heat hydrogen in the presence of oxygen. Previously, in all cases in the past, when we have done this, it has yielded an explosion and produced water vapour. Thus, W tells us at least that we will get water vapour. A *useful* hypothesis, we can then say, is one which can predict what will happen given antecedent conditions (Swinburne, 2004, p30).⁹³ Swinburne recognises this (Swinburne, 2004, p30, pp56-7). He argues that a good scientific theory will rely on the assumption that the future will resemble the past, and will make predictions for the future based on the past, in terms of laws (Swinburne, 1997, p17; 2001, p84). Swinburne also recognises that when two theories have equal prior probabilities, that the one that most closely predicts the evidence, should be preferred (Swinburne, 2001, pp114-5, p80; cf. Swinburne, 2004, p65). For a hypothesis to be successful, then, it should be able to explain and predict phenomena quite exactly. We therefore want a strong theory that predicts (Swinburne, 2004, p30; 2001, p95, see also Howson, 2011, p129).

Another important criterion of a good hypothesis is testability (Newton-Smith, 1996, p44-5, 49, 51, 53, 59-60), that is, whether we can perform a test to confirm the hypothesis.⁹⁴ Thus, the theory W is one which is amenable to testing; we heat hydrogen in the presence of oxygen and observe whether it explodes and produces water vapour.

Now, if theism were a plausible empirical hypothesis, we'd be able to test it. We'd also be able to predict and detect God's effects (Stenger, 2009, pp81-2). It seems, however, that theism is primarily a *retrodictive* explanation. Swinburne also recognises this. He tells us that explaining 'e' with theism should not be taken to imply that he thinks that the universe, *e*, is new evidence (2004, p69); theism seeks to explain old evidence, it is retrodictive. Hence, if we want to think of theism as a really good hypothesis, as opposed to a 'just-so story', we need to be able to show that theism is also a *useful* hypothesis, in the technical sense outlined above. Theism must be able to predict specifics in order to be a good hypothesis, so as to distinguish it over other hypotheses (Howson, 2011, p129). Simplicity alone isn't enough. For example, we'd like to see a claim that for all cases when a person prays for a cure, a cure is effected. Some studies find an effect,⁹⁵ others find none,⁹⁶ and some find adverse effects.⁹⁷

However, if theism is primarily a retrodictive explanation, this doesn't mean that theism is necessarily a bad hypothesis. Consider a legal example. We explain what happened

⁹³ See also Howson, 2011, p129 and Swinburne, 2004, pp56-7, p65 for characterisations of scientific explanation as prediction.

⁹⁴ As we know, Popper believes that we can at most disconfirm hypotheses, we can never confirm them.

⁹⁵ Brown, C. G., Mory, S. C., Williams, R., McClymond, M. J (2010).

⁹⁶ Masters, K., Spielmans, G., Goodson, J (2006).

⁹⁷ Benson H., Dusek J.A., Sherwood J.B., et al (2006).

in a certain circumstance by reference to past actions of, say, a putative criminal C, and his victim, V. The hypothesis, that C attacked V, does not entail that we should expect in the future that C will persist or continue to attack V. As with any inductive argument, there's nothing to say that, without a suitable theory (e.g. that C is a "repeat offender"), that we have any reason to expect future events as likely to resemble the past. Thus, the explanation that C attacked V does not lead us to make future predictions that C will continue to attack V; yet the explanation that C attacked V might well be the right explanation. And the same might apply to theism. Just as God might be the right explanation for the universe now (retrodictively), it does not mean that necessarily, we can expect theism to be able to explain future events (predictively). Indeed, if *deism* is true, this is just what we'd expect; that God would create the universe and then take no further actions. Thus, just because theism is only a retrodictive explanation, and not testable, does not necessarily make it a poor explanation.

However, and this is where the point about predictive explanation is relevant. In the case of C and V, we can infer, knowing what C is like, that he would attack V. Does the same apply to theism? Would theism predict, at the start of the universe, that God would make a universe *like this one*? Swinburne, of course, thinks the answer is yes, for reasons that we'll shortly see. However, the claim of this chapter will be that theism cannot make this prediction, and therefore that $P(\text{elh})$ is low.

Swinburne's Cosmological Argument

In order to demonstrate that theism is a good explanation for the universe, that is, that $P(\text{elh}) > P(\text{el}\sim\text{h})$, the theist must argue for the plausibility of following claims:

1. That the universe has a cause, most likely God
2. That God would create *some* universe
3. That God would create *our* universe, or one very like it
4. That God would create beings like us.

Let's take these in turn.

1. That the universe has a cause, most likely God

The basic intuition of creationism is that our life-capable universe can't just be a brute fact. Some phenomena are just "too odd" or "too big" to be explained by science (Swinburne, 2004, pp74-5, 142-3, 160, 172, 235, 277, 326). By "too odd," Swinburne means things which do not cohere with the scientific paradigm, such as miracles. And by "too big," he means

things that are beyond the explanatory power of science; for example: why there are any laws of nature at all, and why anything exists at all (cf. Leslie, 2000, p14, Swinburne, 2004, p75).

We are all, no doubt, familiar with Thomas Aquinas' 'Second Way' argument, namely, that everything has a prior cause, and that assuming that the causal sequence cannot go back infinitely in time, that there must be a first cause (in Swinburne, 2004, p91). So, the theist anticipates, if we think that our universe existing at all, or having the laws that it does, is somehow anomalous, we need to think of ways to explain it. Yet, even if we can explain how the universe came to be the way it is by appealing to prior states, we cannot explain the existence of the universe in and of itself. Science does not offer us an explanation outside the series of causes; each state of the series is always some prior state within the series (Swinburne, 2004, p142). No matter how far back in the causal regress we look, we find no ultimate cause or sufficient reason for the series as a whole (Swinburne, 2004, p148). Indeed, we cannot explain why there should be any contingent things at all. Like Leibniz, Swinburne asks: Why is there something rather than nothing?⁹⁸ Is there a cause for the universe? Did the universe come to be as it is by mere chance? Or did matter exist forever, even before the Big Bang? Or is there perhaps another explanation? (Swinburne, 2004, p75, p147).

Leibniz, as we also know, argues that there must be a 'sufficient reason' or ultimate explanation for this universe. The Principle of Sufficient Reason (PSR) can be stated as "For every contingent fact *F*, there must be an explanation why *F* is the case."⁹⁹ Swinburne takes Leibniz's PSR and applies it to cosmology: Material entities are contingent; they did not have to exist. Since physical or material causes are necessarily part of the universe, the cause of the universe itself cannot be a physical or material cause (Swinburne, 2004, p144; cf. Leibniz, op. cit.). So, he tells us, the orderliness of one material body cannot explain the orderliness of others. Contingent physical things cannot be the ultimate source of contingent physical things (Leibniz in Swinburne, 2001, p75; 2004, p144). Just as we would not expect two identical paintings to originate by coincidence, but rather that they were copied from an original (2004, p164), so we cannot expect, says Swinburne, that it is a mere coincidence that fundamental particles, for example, all have the same kinds of properties (Swinburne, 2001, p75; p160). It seems instead that some third force or common cause must have made them so, just as a copy of a painting or book must be made by something beyond the paintings or books themselves; a forger, or a previous copyist, say (cf. Leibniz in Swinburne, 2004, p143; cf. Swinburne, 1996, pp36, 42, 49, 55). Thus, contingent facts about the universe, such as the masses and charges of fundamental particles, are not ultimate explanations, but must have

⁹⁸ In Leibniz, *The Principles of Nature and of Grace, Based on Reason*, also in Craig, 1990, pp474-5; Turner, 2003

⁹⁹ Melamed, Y. and Lin, M. (2016). I'd like to avoid a digression into details of the PSR and whether it's true.

prior explanations. Therefore, Swinburne concludes, this universe's existence and properties cannot be explained by the series of physical states (Swinburne, 2004, p144).

That the universe exists at all, then, is surprising, and, that it has any ordered states or repeating patterns at all, is also surprising. Indeed, that the universe continues to exist, is surprising too. Hence, we require an explanation for why the universe is as it is. So, which theory best explains this universe? What could stand as the first cause, or ultimate explanation, or sufficient reason, for our universe? *God*, theists answer. Hence, in Bayesian terms, Swinburne would argue that $P(e|\sim h)$ is low; our universe is unlikely without God. Indeed, God ensures the continued existence of the universe,¹⁰⁰ too, not just its origination (Swinburne, 2004, p94, p144). God, then, is the ultimate stopping point of explanation, and thus likely to be the cause of the universe (Swinburne, 2004, p74, p79, p111, p152).

“So the choice is between the universe as stopping point and God as stopping point... Can we rest with the universe as a brute, inexplicable fact? Leibniz cannot, because the Principle of Sufficient Reason pushes him further.” (Swinburne, 2004, pp147-8).

Aquinas' 'Third Way' makes the same argument as Leibniz.¹⁰¹ And Craig offers us the similar *Kalam*¹⁰² argument. But it does not seem that ultimately, Swinburne accepts Leibniz's argument, or Craig's, for that matter (Swinburne, 2004, p17, pp138-9).¹⁰³ In the particular case of Leibniz, Swinburne understands that Leibniz believes that God represents an *absolute* explanation (logically necessary). Whereas, Swinburne holds, God is just an *ultimate* explanation (a causal stopping point) (Swinburne, 2004, p148).

So, instead of accepting Leibniz's argument, Swinburne says that PSR just amounts to a claim that there must be a terminus to explanation, that there is a cause of the universe, a brute fact. But such a terminus to explanation should only be acceptable if it were of great simplicity and great explanatory power (Swinburne, 2004, p149). Swinburne is just looking for “the simplest starting point of explanation for the existence of the universe” (2004, p106,

¹⁰⁰ This is replied to by the doctrine of *Creatio Continuans*.

¹⁰¹ in *Summa Theologiae*.

¹⁰² Sometimes spelt *Kalaam* or *Kalām*. This argument stems originally from Islamic sources (In Stenger, 2011, p116; Craig, 1991). Craig's argument is often-cited in the literature so I mention it here for completeness. The Kalam argument claims that: (i) anything that begins to exist has a cause, (ii) the universe began to exist, and (iii) therefore the universe has a cause. (iv) That cause was most likely God.

¹⁰³ Swinburne rejects deductive arguments for God, and on pp138-139, footnote 10, Swinburne explicitly rejects the Kalam argument.

pp139-140); he does not feel that the first cause of the universe needs to be logically necessary, or self-explanatory. And in this respect, he and the physicalist agree.¹⁰⁴

2. *That God would create some universe*

Let us turn next to the question of whether God *would* create at all. Swinburne offers us the following argument.

“[The] action of causing the existence of something else is a[n action of a] best kind. God must bring about the existence of other things... a good God to whose power there is no limit will *inevitably go on making more good things...*” (Swinburne, 2004, p117). [My emphasis and edits].

It is likely that an all-good God would create a universe with more types of entities, things, laws, beings, creatures, planets, and so on, because, Swinburne says, having more types is just “better” (*sic*, Swinburne, 2004, p102, p116, p122, p131), and because such a universe is necessary to support humanly free agents (Swinburne, 2004, p121, p127). Since humanly free agents are capable of great good, and making a moral difference to the universe, it follows that God would likely create a life-capable universe so as to support such beings.¹⁰⁵ “A solitary God,” Swinburne adds, “would be a bad state of affairs” (*sic*, Swinburne, 2004, p119). Consequently, “God must inevitably bring about the existence of things apart from himself” (Swinburne, 2004, p117).¹⁰⁶ Therefore, given that the universe has a cause, and the cause is more likely God (because God is “simpler” than the universe), and, given that God is omnibenevolent, Swinburne argues that God would create (Swinburne, 2004, pp121-2).

3. *That God would create our universe, or one very like it*

So, if God is likely to be the cause of the universe, as an all-good being, then it follows that we must ask *what* God would create, if theism is purported to be a good explanation for this universe. In his *Theodicy*, Leibniz says that there are many “possible worlds,” and God could have created any of them (Swinburne, 2004, p104, p114). But if God has “perfect freedom,” (Swinburne, 2004, p98, cf. p80) it seems *prima facie* hard to say which specific possible

¹⁰⁴ It is worth pointing out, however, that this is a somewhat unorthodox position, and that theists generally hold that God is metaphysically necessary. We’ve discussed this matter previously in the Introduction.

¹⁰⁵ We’ll discuss this argument in detail further on. Let’s just accept it for now.

¹⁰⁶ It’s not clear here whether “inevitably” loosely means “as a consequence of God’s goodness”, or whether it means something stronger, e.g. that God had no choice but to do so.

world it is that God would actualise. Thus, we have to find some explanation why God would have made a universe like ours, if theism is to really explain our universe.

Swinburne's answer to this problem starts with his claim that God is all-powerful, perfectly free, and omnipresent (2004, p114). And we saw in Chapter 3, that since God is omniscient, he always knows the truth about which course of action is better. Thus, since God is perfectly free, and since he always knows the truth, he will always follow the right course of action (Swinburne, 2004, pp98-99, pp101-104). "God's perfect goodness follows deductively from his omniscience and his perfect freedom" (Swinburne, 2004, p99, p105). As we saw in the earlier chapter (4) where Swinburne defines God's properties, God is a person with reasons. Thus, "To do an action an agent has to have a reason for acting. A movement brought about by an agent would not be an action unless the agent had some reason for bringing it about." (ibid., p100).

Now, if we know what a person is like, we can infer the probability of his or her likely course of action. Since God is all-good, we know his intentions are certain to be benevolent. "A perfectly free agent" — by which Swinburne means God — "will always do any action that he believes to be the best action available to him." (Swinburne, 2004, p104). And as we've seen, since God is omniscient and knows what the best available action is at all times, God would make such a world as ours — a good world (Swinburne, 2001, p79; 2004, pp114-5; pp131-2). It seems moreover that perfect freedom, including, presumably, God's omnipresence, are what enable God to be omniscient. For he can be anywhere, and he is everywhere. And similarly, if God knows everything (including the right thing to do), and he is perfectly free (he can do anything), it follows he must be perfectly good, because he can never make the mistake of choosing evil, unlike us. Again, as we saw earlier in Chapter 4, "[B]eing perfectly good ... follow[s] from his being omnipotent, omniscient, and perfectly free." (ibid., my edits). "Such a being," Swinburne claims, "will necessarily be ... [the] creator of all things." (Swinburne, 2004, p106).

But it is not clear yet *which* good world God would create if he created at all. For, if there was a unique best-possible world available to God to create, he would create it, because he is all-good. One might think that God would create the best possible world, but, "contrary to Leibniz," Swinburne says, "there could not be such a world," since any number of small differences which are a matter of indifference, could be introduced into such a hypothetical world. So, for example, there could be two different possible worlds, one in which Swinburne existed and wrote his book, and one in which a different person existed but still wrote a very similar book. Which world would be "better"? Clearly neither. Moreover, all universes with free agents are therefore universes in which unpredictable choices are made by persons with free-will. Therefore, "there could not be ... a [perfect] universe." (Swinburne, 2004, p114).

Even if there is an infinite series of increasingly good worlds, or a scenario in which there are no best worlds, God is nonetheless morally obliged to choose the best he can.¹⁰⁷ This world, then, must be one of the members of the set of best possible types of world, if God made it, and, with all its evil, it is the best that God could do,¹⁰⁸ within the bounds of logical possibility,¹⁰⁹ coming up to some minimum level of goodness to be able to be counted as a member of the set of best possible worlds.¹¹⁰ So it is not a matter of there being a *particular* best world; rather, there is a ‘best kind’ of world, and it is a matter of some indifference which one God selects (Swinburne, 2004, pp115-116).

Now, since there are best kinds of actions, creating a universe such as this one would be one of the best kinds of actions God could take. Causing existence is a “best kind” of action.¹¹¹ Everything God creates will be good and beautiful (Swinburne, 2004, pp121-2). Even if God permits suffering in the world that he selects, he is still all-good, and such suffering must exist because it achieves an even greater good, which we are too limited to see at the time (Swinburne, 2004, p116, p122). And if these arguments succeed, Swinburne concludes, given that God is omnibenevolent and omniscient, this is the sort of universe that God would create. As the reader can see, this discussion pre-empts the problem of evil, which we’ll discuss in Chapter 11.

What we have, then, is an argument for saying that God would create one of the very good worlds, if he exists. We might say that given God’s nature, these considerations are meant to show that it is probable that God would create, since creation is a good thing. On the assumption that this world is indeed a very good world, this is meant to show us that P(elh) is reasonably high. Whether this world is in fact one of the very good worlds, is what we’ll discuss below in the criticisms section and in the later chapter on the problem of evil. But we must now consider the final stage of Swinburne’s cosmological argument, where he indicates that it is likely that God would create beings like us.

4. That God would create beings like us

Swinburne argues that God will create living beings. The question is, what type of beings? Swinburne starts by suggesting that since God will necessarily create, he will at least likely create other divine beings, such as the Holy Ghost, and the Son (Swinburne, 2004, p118). But

¹⁰⁷ Swinburne, 2004, pp104-5; Rowe, 2005, p464; 1999, p101

¹⁰⁸ Hasker, 2005, p454, p461; Hasker, 1984, p213; Swinburne, 2004, p116

¹⁰⁹ Morris in Hasker, 2005, p458; Swinburne, 2004, p113

¹¹⁰ Hasker, 2005, p460; Howard-Snyder et al., 1999, p117; Swinburne, 2004, p102, p105

¹¹¹ Swinburne, 2004, p102, pp104-5; p114; p117; Rowe, 2005, 464, 1999, p101; Hasker, 2005, p454; 1984, p213. As we know, Benatar rejects this view in his 2008 book: *Better Never to Have Been: The Harm Of Coming Into Existence*.

the probability of there being “humanly free agents (and so a universe),” he says, with qualifications, is 0.5 (Swinburne, 2004, p123).¹¹²

Now, since conscious beings are more capable of regard for other beings, Swinburne argues, they are capable of morality, and thus it follows that conscious beings are better than non-conscious ones, and more intelligent beings are better than less intelligent ones. “A conscious life is a good thing,” he says, and “[a]nimate substances are substances of a better type than inanimate ones” (Swinburne, 2004, p117). “As we move up the evolutionary scale,” Swinburne continues, “we find animals whose actions are less a matter of instinct, and more a matter of learning and so knowledge.” (p121). Since it is a best type of action to create conscious moral beings, the probability of a good God creating them is 1.0 (*sic*, Swinburne, 2004, pp117-119, p123).¹¹³

It would be good, Swinburne says, that there would be creatures that could make a difference to the moral status of the universe through their learning, knowledge, and actions. But creatures, especially those with free-will, need bodies to move about in the universe, to learn, grow and prosper (*sic*, Swinburne, 2004, pp121-3, p127, pp130-131). And making other types of creatures, such as animals and/or angels, “would be acts of equal best kinds.” (p120).

“And God has the same reason for bringing about plants and animals—their beauty. And animals are good also, I have argued, in virtue not only of their beauty but also of their ability to have pleasant sensations and true beliefs and spontaneously to do good actions (even if not ones freely chosen).” (Swinburne, 2004, p188).

And since the great good of free-will entails that beings be able to inflict pleasure and pain, suffer and love and transmit knowledge, necessarily such beings need to be able to learn and act, and choose to act or refrain from acting based on perceptions and learning. But in order to carry out such actions, creatures need to be situated in a space and time which is governed by regular laws and has regular features which can be learnt and responded to. Creatures also need to be able to communicate (Swinburne, 2004, pp125-7).

However, since creatures such as humans have limited knowledge, they’re subject to irrational tendencies which lead them to perform evil acts (Swinburne, 2004, p118). So, for their own good, and so as to limit the amount of harm they can do, creatures need to be physically limited, and situated in finite bodies (p120). They also need ways to express their

¹¹² It is worth pointing out here that this entails that $P(\text{elh}) = 0.5$. And so, if theism is meant to explain our universe better than alternatives, it implies that $P(\text{el} \sim \text{h}) < 0.5$ for cases where there’s more than one alternative to theism.

¹¹³ And if a world is required to support the existence of conscious moral beings, this seems to imply that $P(\text{elh})$ is also 1.0. However, let’s not pre-empt Swinburne.

desires, and ways of carrying out their intentions to fulfil those desires (Swinburne, 2004, p122, pp127-130). God would therefore want to limit us so that we can limit our tendency to do evil (2004, pp120-122). But our tendency to do evil is not necessarily a side-effect of free-will. Instead, evil is a result of choosing incorrectly due to inadequate understanding of the right reasons to do something (Swinburne 2004, p98 et seq.). Thus, whilst God is omnipresent and perfectly free, he must limit us to limit the damage we can do. The reader may think that since free-will leads to the possibility of free beings choosing to do evil, that a good God would not let his creatures have free-will. Swinburne however argues that free-will is a greater, “special kind of goodness.” (Swinburne, 2004, p120). Yet this freedom is just the sort of good that a good God would create, just as a good parent would grant his child the freedom to learn by experience, within reasonable limits.

Clearly, again, we are beginning to touch on the problem of evil, a matter which will be discussed in much more detail in Chapter 11. But we may summarise Swinburne’s arguments as follows: If we understand *e* to be a life-capable universe with free moral agents, then, given God’s nature as omnibenevolent, it is reasonably probable that he would create a universe like that. In short, again, $P(e|h)$ should be high.

Swinburne’s cosmological argument: Summary

Swinburne argues that $P(e)$ and $P(e|\sim h)$ are low because our universe is unlikely to arise by itself, without theistic explanation. Likewise, Swinburne argues, since theism is simple, and since, in his view, simpler theories are more probable *a priori*, $P(h)$ is high for theism. Lastly, Swinburne argues that a theory has good fit with the evidence or data if it fits the known data and our background knowledge (Swinburne, 1997, p53), that is, $P(e|h)$ is high.¹¹⁴ We’ve also seen that he acknowledges that both theism and physicalism fit the evidence (Swinburne, 2004, p108). But given that God would create sentient beings, Swinburne argues, it is highly probable that God would create a universe *so as* to support them.¹¹⁵ Thus, Swinburne concludes, this universe is just the sort of universe that God would create. The probability of this universe arising, given God, is greater than the probability of this universe arising, in and of itself, without God; $P(e|h) > P(e|\sim h)$. In other words, the likelihood of theism is high, given the evidence of this universe. Hence, if Swinburne can make good on these arguments, he would have presented us with a good C-inductive argument for theism.

¹¹⁴ We have already seen why this is impossible, in Chapter 7. However, let’s run with his argument.

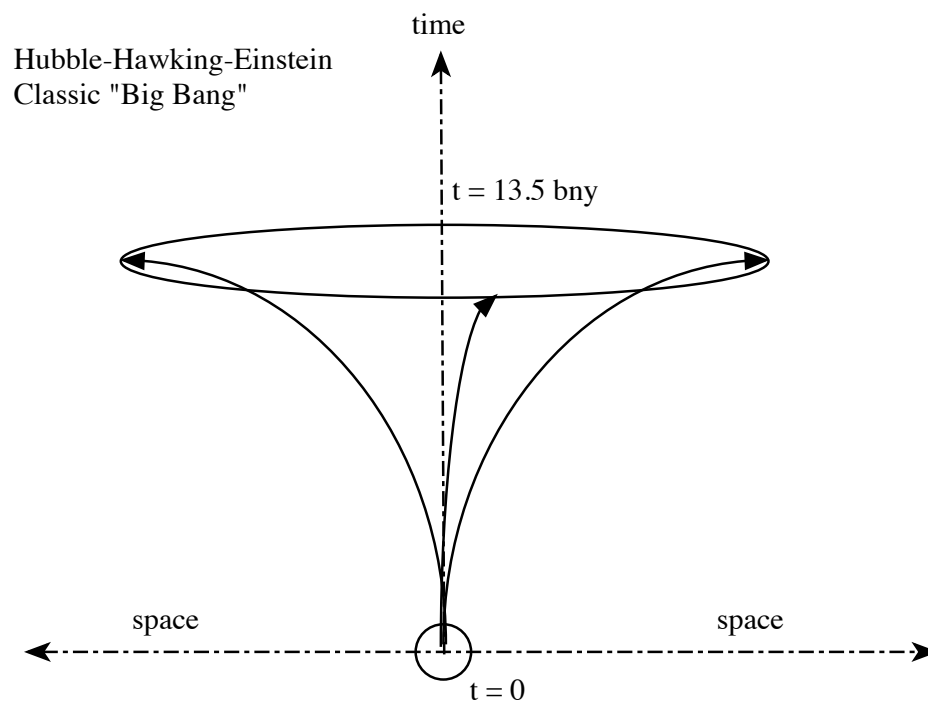
¹¹⁵ This is the gist of Swinburne’s teleological argument for God.

Criticisms

1. That the universe has a cause, most likely God

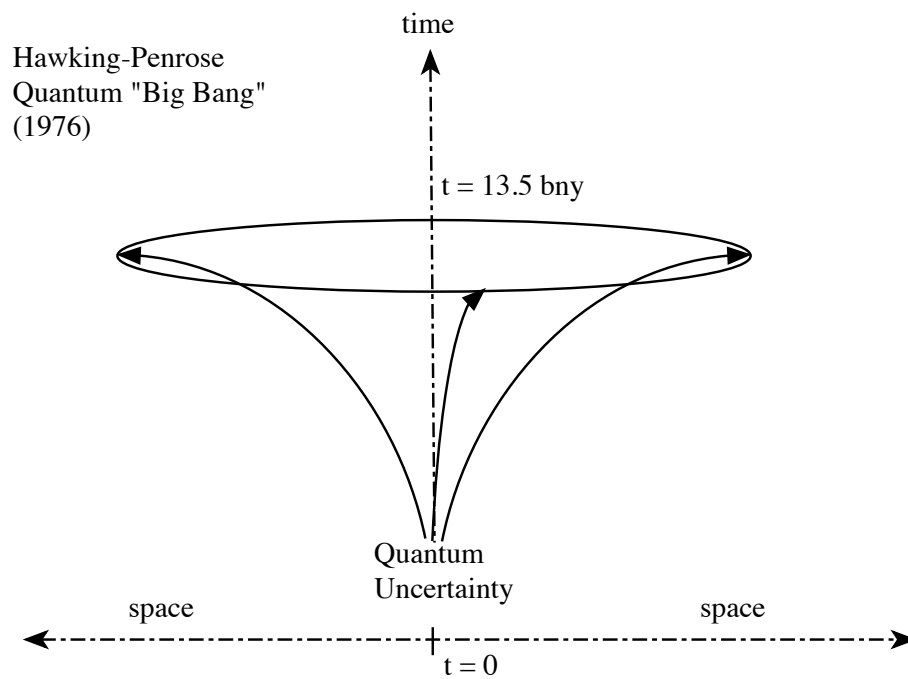
Both the theist and the physicalist claim that they have a stopping point of explanation (cf. Swinburne, 2004, p74). Whilst theists argue that God is the ultimate explanation because he's "simpler" (Swinburne, 2004, p98, p106), or because he's a person (*ibid.*, p97), this doesn't satisfy a physicalist. It seems highly implausible to a physicalist to say that a personal being with a mind should antedate things that *seem* much simpler and cruder, such as leptons (cf. Mackie, 1982, p148-9). And once a theist grants a physicalist that leptons, etc., exist or come into existence in the right quantities, and that biological evolution occurs, the rest of the entire universe follows from sheer scientific law, without any need for divine intervention. Theists generally hold (excluding Swinburne) that there is an uncaused cause for the universe, specifically, God. And since God is unchanging and eternal, the theist will generally hold, God needs no cause to explain his own existence. One argument to support this view may be the claim that that God is somehow metaphysically or ontologically necessary. But as we have already mentioned, Swinburne rejects this (*sic*, 2004, p148*n*). Since God's existence is a contingent fact, in Swinburne's view, then either God's existence is a brute fact or one that requires explanation. Another motivation might come from contemporary cosmology. On a conventional understanding of Big Bang cosmology, there is a point in time in which the universe came into existence. The universe, as something that 'began', has a cause, according to many theists, for example Craig's *Kalam* argument (in Stenger, 2011, p116; Craig, 1991). Time, Craig maintains, started with the singularity (cf. Hawking in Stenger, 2011, pp121-3; see Figure 3). And so, something is needed to explain where time came from, or what caused time to start. But modern cosmology denies an explicit start to time. It's quite possible, given quantum mechanics, that $t=0$ never really existed (see Figure 4). "Nothing of what we know about the Big Bang requires us to assume that it was the beginning of the universe." (Stenger, 2011, p119).

General Relativity breaks down before you reach $t \approx 0$ on the cosmological scale (Stenger, 2011, p125). Quantum mechanics, instead, could have started the universe (Stenger, 2011, p117). Moreover, Hartle, Penrose and Hawking, in their later research, suggest that instead of a specific singularity that starts space and time (as shown in Figure 3), there could have been a quantum mechanical phase in which space and time were uncertain (as shown in Figure 4). If this theory were true, time would be fuzzy at what we might call $t=0$ (Davies, p92; also in Stenger, 2011, p142 et seq.), hence we have to write $t \approx 0$. So the question of "what came before" is meaningless, since there is no well-defined beginning, as such.



(Stenger, 2011, p132)

Figure 3. Hubble-Hawking-Einstein classic "Big Bang"



(Stenger, 2011, p132)

Figure 4. Hawking-Penrose Quantum "Big Bang"

The original Einstein-Hawking characterisation of the Big Bang is, therefore, no longer supported by cosmologists (Stenger, 2011, pp123). Thus, there may well have never been a singularity (Narlikar, 1992, p369); that is, if the start of space-time was quantum-uncertain, it does not leave room for a definite singularity and hence a definite start.¹¹⁶

In 1983, Hartle and Hawking proposed an incoming and outgoing wave on either side of $t \approx 0$ much like the BGV model shown in Figure 10 in the next chapter. They called it the ‘No boundary condition’ model. This model defeats the claim that there has to be a specific beginning in time. The expansion of the universe began at some stage, but some particles may have just existed timelessly, somehow tunnelling through the $t \approx 0$ barrier (Stenger, 2011, p128). There may even have been a period in which some particles may have gone through $t \approx 0$ unscathed, creating what we will later call a ‘memory effect’. Indeed, time’s direction may simply have been reversed on the other side of $t \approx 0$ (Stenger, 2011, p130). The point is, there are a variety of physicalist models that can answer the theist’s question of “what came before?”, all of which can undercut the theist presupposition that the universe (unlike God) must have a cause or a definite beginning.

Of course such cosmological models are highly speculative — but no more speculative than theism (and probably less so, since they are grounded in well-established scientific theory). Therefore it is at best unclear whether we ought to accept the claim that universe had a beginning and/or a cause. It therefore seems more reasonable to withhold judgment on the beginnings of the universe, and wait for further empirical evidence, say, from multiple universe theory, discussed in the next chapter.

We might note in addition, even if Hawking et al., are correct and the universe has no beginning, there are certain forms of cosmological argument on which this does not matter. Theists typically think that even if there is no beginning to the universe, then since the universe is contingent, it will require explanation; and they offer God as that explanation. Of course, if like Swinburne, you think that God is also contingent, then this kind of argument would lead you to think God, too, requires some explanation and justification; and some independent reason would be needed for thinking that it is preferable to posit God as an unexplained brute fact, as opposed to the universe being the unexplained brute fact.

One possible reason someone like Swinburne might offer is that God offers a very natural and hence probable explanation of the universe. Theists claim that God, *qua* infinite being, is useful to explain the universe, since it’s simpler to assume that something as large and impressive as the universe would best be explained by an omnipotent, omnipresent being. Yet this seems false. Hume raises this objection.

¹¹⁶ This position has just been supported again by Gielen and Turok (2016): “Our results indicate that a valid semi-classical approximation to quantum cosmology with conformal matter can be obtained from complex classical paths which avoid the classical big bang singularity.”

“A very small part of this great system [the universe], during a very short time, is very imperfectly discovered to us; and do we thence pronounce decisively concerning the origin of the whole?”¹¹⁷

Our universe is not actually infinite (it seems to be 13.73 billion years old and 91 billion light-years across). Thus, it seems that God needn't be infinite (or we are just ignorant of the extent of the universe). And if this argument is cogent, it seems that we could have a finite brute fact (a finite cause of a finite universe), which needs no further explanation. And that finite brute fact could just as easily be a singularity rather than God; or it could be a finite god. A god of extremely great but not infinite power could have created this universe. Firstly, this means that we do not in fact need God to be infinitely powerful. Secondly, *contra* Swinburne, whose intuition is that an infinite amount of power doesn't need explaining, it seems that omni-properties would be just a brute fact competing with science's brute facts, and thus, inasmuch as he believes that the brute facts of science need an origin and explanation, the physicalist can reply that the theist is susceptible to the same criticism, unless he can show that God necessarily exists. Fortunately, Swinburne does admit that God is a contingent brute fact (Swinburne, 2004, p79).

2. That God would create some universe

Let's now consider the second step of the argument, namely, whether God would create anything at all (cf. Angeles in Huberman, 2007, p10). We have considered some arguments that Swinburne has given for claiming God would create, and that God would create a world at least somewhat like ours. But it seems quite easy to construct other *a priori* arguments which would lead us to the opposite conclusion. I would therefore like to present the reader with four counter-arguments in this and the next section; which I call the No-Creation Arguments, **NCA₁₋₄**. In this section, I merely express the argument for just the case that God would not create. I call this **NCA₁**:

NCA₁: *That a perfect being would not want anything, because it is perfect.*

- (1) God is a perfect being (Swinburne, 2004, pp7-8)
- (2) God is a person (Swinburne, 2004, p42, p34, p38).
- (3) Perfect beings want nothing and lack nothing [By definition].
- (4) Persons act to satisfy wants or lacks [Premise].

¹¹⁷ Hume, D. *Dialogues Concerning Natural Religion*, Part 2, para. 22; my insertion in brackets.

- (5) Creation is an act, and acts are performed to satisfy wants [By definition; 4]
- (6) God could not have wants because he is perfect [3]
- (7) Therefore God would not have created [4; 5; 6].

Turner (2003) has a fair answer to the question of why God created, which challenges premise (4). He says that life is a gift from God, and giving implies the same spirit of generosity or creativity as of an artist creating an artwork. Creation, he says, is an expression of creativity and love. We do not ask why Mozart created specifically the opera *Figaro* rather than anything else that he could have done; he just did. Hence, Turner maintains, the creation of the universe was an *aesthetic* act. Swinburne agrees (2004, p188). Another way to parse this idea would be to refer to it as a spontaneous act of generosity, for example, out of love. Whilst this response might address **NCA₁**, it does not address **NCA₂**, **NCA₃**, and **NCA₄** which I offer below.

3.1 That God would create our universe, or one very like it

The first two of these three variations on the No-Creation Arguments rely on the argument from evil. As we've mentioned, we will discuss the Problem of Evil in more detail in Chapter 11. All that this argument requires is just the observation that evil exists. Let's start with **NCA₂**. **NCA₂** argues that a universe with just God is perfect, and therefore God would not create:

NCA₂: *That a perfectly good being could not deliberately create evil.*

- (i) God is infinitely perfect, omnibenevolent, and omnipresent [From 1].
- (ii) A universe with God, already contains an infinite quantity of perfection [From 1, and from the fact of God's definitional omnipresence].
- (iii) An infinite quantity of perfection cannot be improved upon [By definition].
- (iv) Adding beings would not make circumstances more perfect [iii].
- (v) God is all-good, and would never want to make things worse [1; i].
- (vi) Adding beings capable of evil would likely make the universe worse [Premise].
- (vii) By creating such a universe, God could only have made existence worse [iv; vi]
- (viii) Therefore God would not have created [iv; v; vi; vii].

NCA₃: *That a perfectly good being could not sustain evil.*

- A) God is omnibenevolent
- B) God sustains the universe through *Creatio Continuans*, moment-by-moment
- C) Evil exists

- D) Therefore God sustains evil [B; C]
- E) God is omniscient
- F) Therefore God would know, prior to creation, that in creating this universe he'd create beings capable of evil and that he'd have to sustain evil, moment-by-moment [¹¹⁸]
- G) Therefore God would rather not create, because he's omnibenevolent [A, F].

From the above arguments, we can see that God would not have created; firstly, because you can't improve perfection, and secondly, because God would not sustain evil.

Given these arguments thus far, it seems that only premises (4), (vi) and (B) are debatable; yet it is not clear how a theist would debate all of them. For we know well that we act to satisfy wants or lacks (4), even a need to be creative. And we know that being capable of evil raises the probability that evil will be done (vi). And many theists accept *Creatio Continuans* (B). So it seems that these arguments defeat the claim that God would create. Thus, so far, P(elh) is extremely low.

There is, moreover, a further concern relating to **NCA₃**. Why would God *stop* creating, once we existed? If creating more and better things is what God does (Swinburne, 2004, p122), *qua* omnipotent and omnibenevolent, it seems that God ought to continue to create forever:

“[A] good God to whose power there is no limit will inevitably go on making more good things.” (Swinburne, 2004, p117)

“In general it will always be a better act to create more—more humanly free agents, and animals, and a larger physical universe (or more physical universes)... there is no maximum to the more[.]” (Swinburne, 2004, p122)

“And so, plausibly *ad infinitum*, for plausibly there are an infinite number of possible species.” (Swinburne, 2004, p116).

Since God is infinite, he must have existed infinitely. Thus, an infinite amount of created matter must already exist, with an infinite amount of good beings with free-will. Yet we do not observe this; our universe seems to be limited to about 19 billion light years and just 7.2 billion creatures with free-will. Which means that if we argue that God continues to create, to

¹¹⁸ cf. Timpe, K., and Speak, D. (Eds.) (2016), p12. Also Phillips in Betenson, 2015, p103 and Simpson, 2009a, p161. These authors all recognise the implication that *creatio continuans* implies that God would have to keep evil in existence; however we can now apply the idea to creationism itself.

this day (i.e. that there was no “moment” of creation, but rather creation that is ongoing), it follows that some universe like our universe would certainly exist, and be getting larger and fuller, which again we don’t observe to be true; it seems to be getting larger and emptier. Again, this suggests that evidence *e* does not agree with theory *h*, so again $P(\text{elh})$ is low.

The theist can however respond to this concern. The theist could just claim that God is creating continuously in the sense of *creatio continuans* (Swinburne, 2004, pp142-3; 2001, p75); that is, God’s continuous creation is manifested by our continuing to exist. However, we’ve seen the problem with that in **NCA₃**. Another response from the theist would be that God could be creating more and more new parallel universes, which would agree with the Multiple Universe Theory and support the higher probability of our universe existing.¹¹⁹ I think the latter argument, though *ad hoc*, would be a suitable response to the criticism, but that it would play into the physicalists’ hands, as we see in the next chapter.

So this leads us to **NCA₄**, *The overkill argument*. The overall prevalence (by sheer mass) of dark matter, black holes, dead gaseous planets, insects, etc., in this universe suggests that God prefers inanimate or amoral unintelligent entities to intelligent moral beings. We certainly don’t need all this inanimate matter, given an omnipotent deity, for humans to exist; the universe could just be limited to our solar system, or even less; just the sun, earth and moon. Or it could just be a universe of angels. It seems something of an ‘overkill’ that we humans should be the ultimate point of all these millions of galaxies. “It is like mixing a batter of dough as big as the sun to bake a single crumb of bread.” (Teller, W. in Huberman, 2007). **NCA₄**, then, argues that even if God created, he’d not likely create this universe, or one like it. If God’s job was to maximise the good,¹²⁰ God should have preferred a universe populated thoroughly and exclusively by an infinite quantity of (infinitely good) angels (cf. Swinburne, 2004, p122), since infinity is the simplest option, by Swinburne’s own claims. Yet this is also not what we observe. Instead as **NCA₄** argues, we see a disproportionately large amount of dead matter and evil, rather than living good beings.

Hence, our observations (that our universe is mostly dead and has a lot of evil) disagree with the predictions of creationism (that an omnifarious God should create infinite amounts of living matter and infinite numbers of extremely good beings), as such, $P(\text{elh})$ is low.

¹¹⁹ More on this will be discussed in later chapters.

¹²⁰ It seems that this universe is significantly worse than what we’d expect from God, for by bringing us all into existence, he’s done us some significant wrongs, as we will likely all experience serious suffering in our lives, as Benatar (op. cit.) tells us. Assuming that the reader has Christianity in mind, we could even hold God responsible for short-sightedly creating our own situation which ultimately led to sin, and the Fall (Lang, pp3-4). Recall: God is omniscient; so he should have known how it would turn out.

3.2 The Divine Indeterminacy Argument, DI

As we've seen thus far, Swinburne argues that God's being omnipotent and omnibenevolent means at most that he will select a 'best kind' of universe.¹²¹ As long as the universe was in the set of "best kinds", which could be a large set, it is an appropriate universe to create. And we've already seen some objections to this, namely that our universe isn't the sort of place that we'd expect God to create. However, the matter is more complex than that.

Consider the theist's own claims that God is omnipotent, free, and able to choose whichever universe he wants. The more options God had to choose from, the lower the chances of any particular one of them being selected (cf. White, 2000, p272). Theism, then, does not explain our exact universe (Swinburne, 2004, pp114-5). But this results in an argument which I call 'divine indeterminacy' (DI).

DI: It is indeterminate, and indeterminable, which universe God would have chosen to actualise, since God would have reason to actualise any universe from a likely infinite selection of good-enough possible universes. Where n are the number of creatable logically possible good universes, the probability of God creating our universe is $1/n$ (cf. Swinburne, 2004, p123; cf. Holder, 2002, p296.). Thus, the likelihood of theism is $P(\text{elh}\&k) = 1/n$. Theism fails to explain our universe.

In this argument, if the e is more specific, it's our universe; whereas if it is less specific, it is just "a" universe. We will see in Chapter 10 that White (2000) makes a similar distinction. Yet if this is correct, it seems that it is improbable that God would have specifically chosen our universe, even though it certainly would have been present in the ensemble of possible universes that the divine mind could contemplate; that is, even if God would make *some* universe (White, 2000, p273; Holder, 2002, p310).

Unless Swinburne makes a strong claim which reference class of universe he has in mind (*any* universe, a *life-containing* universe, a universe *with intelligent moral life*, a universe *just like ours*, etc.), he doesn't really have grounds to say that our universe is improbable, or that $P(e)$ is low; depending on which universe God would select, or, that God would select just that universe. In short, the more specific and the more fine-grained Swinburne's "explanation" of our universe is required to be, the lower the $P(\text{elh})$ value, since a more specific universe is less probable. For example, if Swinburne just claimed that God would create a living universe, $P(\text{elh})$ might be quite high. However, if Swinburne thinks that his model explains precisely this universe (give or take some contingent facts like whether

¹²¹ Swinburne, 2004, pp104-5, p120; Hasker, 2005, p454; Hasker, 1984, p213; Swinburne, 2004, pp104-5

Swinburne wrote his book (Swinburne, 2004, p114)), $P(\text{elh})$ must be very low, from **DI** and **NCA** above.

Theism at most establishes that there is a smaller infinite range of universes¹²² that God had available to choose from (the ‘best types’); it doesn’t establish that the probability of God choosing a universe like this is significantly greater than zero. In other words, as there are a staggeringly large number of possible good universes, it follows that our universe is *still* highly improbable. Which suggests that theism has not in fact explained our universe. It doesn’t seem *prima facie* implausible, for example, to argue that God could conceive of say, 1000 reasonably good universes to make, and that therefore that $P(\text{elh})$ is 0.001, which is very low. Hence, we have good reason to suppose that we couldn’t tell what God would want to create, if he created at all (cf. Monton, 2006, p418).

4. That God would create beings like us

We can recognise that Swinburne’s argument has some intuitive appeal (we probably all agree, for example, that I am in some sense better than a rock). And Swinburne explains that it has to do with moral worth (2004, pp117-118). Having creatures with the capacity for good moral action adds up to a universe which is better, as more moral beings adds up to a universe with a greater quantity of goodness.¹²³

But would God even create humans who are capable of evil? Naturally, we’ll discuss this matter in more detail in Chapter 11. However, it’s worth mentioning this discussion at this juncture where we are considering a value for $P(\text{elh})$. Consider angels. Angels are typically thought of as being spatially limited spirits of a sort, and yet are good (Swinburne, 2004, p130).¹²⁴ So one might expect a perfectly good omnipotent God to therefore create at worst, angels. Why didn’t he, then, create only those creatures incapable of evil? (Mackie, 1982, p174; McCloskey, 1960, p111). God could have given us free-will with a tendency to only do good (Mackie, 1982, p172; 1955, p209; Rowe, 1998, p277), or be wise rather than foolish (McCloskey, 1960, p111-112; Mackie, 1982, p165).¹²⁵

¹²² The reader might be perplexed by this phrase. Infinities are not equal. Compare the infinite series of odd numbers or integers to the infinite series of all real numbers; both series are infinite, but the latter outnumber the former.

¹²³ Assuming that Benthamite ‘hedonic calculus’ of moral phenomena makes any sense.

¹²⁴ Naturally, we can recognise that Expanded Theism includes stories about angels having free will and choosing to do evil, e.g. Satan/Lucifer, the fallen angel.

¹²⁵ Plantinga objects that it is possible that all creatures in all worlds contain some depravity such that they will freely choose to do evil at some time in all possible worlds (they’re trans-world depraved) (Plantinga in Mackie, 1982, p174, and in Rowe, 1998, p116). Were a person to only choose good in all possible worlds, they’d be “trans-world holy,” (Rowe, 1998, p117), or, as Plantinga calls it, “an instantiation of a perfect possible person.” But God cannot instantiate such persons *and* give them free choice *and* determine their actions in advance (Plantinga, 1966, pp106-7, Plantinga, 1966, p108). Hence, it is highly probable that all creatures with free-will

Perhaps, then, God is like an engineer who makes a machine that is later sold to a client, and the machine is thereafter out of his control. But even if a creation is out of its maker's control, it's still arguably the maker's fault if it goes wrong, since he made it, including its behavioural tendencies (Mackie, 1955, p211; 1982, p176). Consider also the following analogy. There's a difference between compelling someone to do something, and selecting someone who will do something. Compare: *I hire a man and I make him do a job*, versus, *I hire a man who I know can do the job*. In the first case, I compel the man to do the job. In the second case, I hire him because I know that he will do the job of his own free-will. Here's another example: I make a statue out of copper, and paint it green. That way, I make the statue green. On the other hand, if I merely make a statue of copper, and leave it, it will turn green by itself as it corrodes, without me making it do so (Pike, 1966, p102). So, in one case, I deliberately make a statue green (or make a man do a job), and in another, I let it go green, or do a job, by itself. Clearly, if God is omniscient, he'd know that the statue would go green, or the man would do the job, without God's intervention. God should therefore *know in advance* what kinds of people he is creating, and that they will turn out evil (Pike, 1966, p103). Like a chess-player anticipating his opponent's moves, God should at least know what his creatures *could* do, even if he could not know what they *will* do due to free-will.¹²⁶ As argued in NCA₂, God knew we would very probably perform evil, and nonetheless created us.¹²⁷ Therefore, the theistic claim that God would have wanted to create beings like us is improbable, and P(elh) again is low. We'll discuss this objection further in Chapter 11.

Consider the argument, now, about why we need bodies, or that it's better for us to have bodies. Swinburne believes in substance dualism (2004, Chapter 9). And because God is disembodied he is able to access all information without obstacle. If embodiment were good, God would be embodied. It is because God is *not* embodied and limited that he is all-knowing and all-good (Swinburne, 2004, p99, p101). Our ability to do good must be as limited as our bodies, which God gave us. Thus we are only evil *because* God limited us; not the other way around.¹²⁸ Therefore, God would not make beings like us. Again, P(elh) is low.

Finding a value for P(e)

It's not clear, anyway, that our universe is improbable. In order to say whether our universe is in fact improbable at all, and in need of explanation, we need a value for P(e). We can

are trans-world depraved. Yet if all creatures are trans-world depraved, heaven may end up empty (Hasker, 1992, p103). So by allowing free-will, God was taking a risk of trans-world damnation (Hasker, 1992, p104).

¹²⁶ Mackie, 1982, p164; Plantinga in Rowe, 1998, p275; Rhoda, 2010, p5; Plantinga in Rowe, 1998, p275; Hasker, 1992, p95

¹²⁷ Mackie and Flew in Pike, 1966, p103; Rowe, 1998, p274

¹²⁸ Genesis 3:22 seems to imply that God *didn't* want us to be divine or morally aware.

calculate $P(e)$ from the Total Probability Rule (TPR). This requires us to also consider $P(e|\sim h)$, as Swinburne is aware:

“If, as I suggested, $P(h|k)$ might be very small (so improbable is it *a priori* that there should exist anything at all), $P(\sim h|k)$ may be very large. *So the value of $P(e|k)$ will turn crucially on $P(e|\sim h \& k)$, the probability that, if there is no God, we will have the evidence that we do.*” (2004, p112). [My italics].

What we need to consider then, is not only whether we have grounds for thinking the likelihood of God’s existence is high or low ($P(e|h)$), but also the value of $P(e|\sim h)$, so that we can get a value for $P(e)$. If Swinburne can make a case that $P(e|h)$ is higher than $P(e|\sim h)$ he will have produced a sound C-inductive argument. Yet in the next chapter we will look at alternative, naturalistic accounts of the origin of the universe which argues that $P(e|\sim h)$ is high.

Furthermore, it should be remembered that the denial of theism, $\sim h$, includes not only naturalism or physicalism, but polytheism and aberrant forms of monotheism, for example, theories in which a single evil or indifferent God exists, deism, etc. In order to get a full assessment of Swinburne’s argument and whether it succeeds as a C-inductive argument, these other hypotheses must be taken into account. We won’t perform this assessment in this thesis for reasons of space. However, if we take Swinburne’s view that polytheism and other theistic hypotheses are less probable than restricted theism, we can at least consider $P(e|\sim h)$ to comprise mostly the naturalistic account from multiple universes. And if that theory is plausible, then $P(e)$ won’t be as low as Swinburne thinks.

Conclusion

Swinburne has argued on the basis of God’s nature that we should expect him to create a good, life-supporting universe with free agents. But we have also seen that there are very reasonable grounds for thinking a genuinely perfect being would not create, as argued in **NCA_{1,3}** above. Moreover, even if we think God would create because this is in some sense good, it seems reasonable to think God would have created more — more life, more moral agents, angels — and not filled the universe with lifeless matter. In other words, **NCA₄** — the overkill argument — is probably correct. On this basis it is very difficult to persuasively argue that $P(e|h)$ is high. Theism doesn’t explain the evidence.

When we turn to consider the features of our universe in more detail, we can see from **DI**, where there are n good creatable logically possible habitable universes, our universe is

still as improbable as before — $1/n$. So if we take that more detailed characterisation of e to be the appropriate way to understand the evidence, then $P(e|h)$ must be very low.

Therefore, so far, we have seen that $P(h)$ is indeterminable (or low, if $P(e)$ is low or $P(e|h)$ is low), and, we've seen $P(e|h)$ is low. Thus, all that remains is to determine a value for $P(e)$. We saw some attempt at this, above; and we saw in the introduction that part of the attraction of the cosmological argument is that the theist and the atheist accept the premise that $P(e)$ is low. But perhaps $P(e)$ is not as low as theists think. We now turn to the physicalist Theory of Multiple Universes (MUT).

9. Can some Multiple Universe Theory answer the theist?

Introduction

Thus far, we have seen the theist argue that God would probably create this universe. In other words, that $P(e|h)$ is high. We have seen reasons to think that even on a generous conception of the connection between explanation and probability, that that conclusion is unjustified. However even if $P(e|h)$ is relatively low, e , the existence of our universe, can still confirm theism over alternatives, if $P(e|h) > P(e)$, that is, it can still supply a C-inductive argument.

We also saw in the Introduction that many physicalists accept that the universe is *a priori* improbable; that without some suitable explanation, our universe would indeed be unlikely. In other words, we saw that $P(e|\sim h \& \sim M)$ is very low, where h is theism and M is some physicalist alternative. In the simplest terms then, we need to consider two sorts of probability relations. First, and most importantly, we must consider whether $P(e|h)$ is higher than $P(e|\sim h)$. If it is, the existence of our universe confirms theism; in Swinburne's terms he would have a successful C-inductive argument. The trouble with assessing this view is that $\sim h$ can encompass many other versions of theism, atheism, physicalism, etc. Secondly, we must consider whether $P(e|h)$ is higher than $P(e|M)$. The argument of this chapter will be that it's not obvious either way that $P(e|h)$ is higher or lower than $P(e|\sim h)$ or $P(e|M)$.

Let us start by considering some reasons that theists and cosmologists offer for thinking this universe is improbable. Theists and cosmologists both offer long lists of properties of the universe that are apparently fine-tuned, and which, were they varied, would prevent the formation of life.¹²⁹ Imagine a lottery machine with four possible numbers that emerge, and an almost infinite number of balls, each ball representing the possible initial values of the fundamental physical constants that determine the form of our universe. In such a scenario, where only one sequence can yield an ordered, life-capable universe, it seems highly improbable *a priori* that such a universe would arise (Holder, 2002, p297). Consider, for example, why the universe does not feature an equal amount of matter and antimatter? (Davies, P., 2007). Why are the values of the four constants — the electromagnetic field strength, the strength of the strong nuclear force, and the masses of the electron and proton —

¹²⁹ This is the key argument of many authors presenting the theistic hypothesis and the improbability of our universe being life-supporting. It is mentioned by Swinburne, 2004, p150, 160, pp172-7, pp157-8, p181; Leslie, 2000, p12; Juhl, 2006, p269; Holder, 2002, p295 et seq.; Giancoli, 1990, p396; Van Brakel, 1988, p75; Davies, pp158-166, 2007; W. L. Craig in Stenger, 2011, pp20-21; and Craig, 1991; Penrose, Ch. 10; Vilenkin, 2006, p131.

so specific to as enable chemistry, and hence, biology? (Stenger, 2011, p235).¹³⁰ Why is gravity much weaker a force, by a specific ratio of $1:10^{39}$, than electromagnetism? (Stenger, 2011, p147, cf. Vilenkin, 2006, p131). All of these examples show how difficult it is to imagine that the universe is life-hospitable as a matter of sheer chance. A “Goldilocks Zone” is an area in space, suitably distant from a star, where a planet is suitably warm, and has sufficient oxygen, water, and organic chemicals, for life to form. Did we not live in such a Goldilocks Zone, we’d not exist. How did it come to be that our earth is in a Goldilocks Zone?

The same applies to the formation of heavy elements in stars (nucleosynthesis). However unlikely it was, these heavy elements indeed formed. Were there no mechanism to cause this, we wouldn’t be here.¹³¹ To form the earth, some star prior to the sun had to have existed (and gone supernova) such as to produce all the necessary compounds that later formed the solar system. And in order for that to happen, the nuclear forces and subatomic particles and laws of physics all had to be a certain way (Swinburne, 2004, pp172-7, pp157-8; Juhl, 2006, p271). The universe’s expansion rate also had to be fine-tuned. If it had expanded too rapidly, it would have suffered heat death, and if it had not expanded rapidly enough, it would have collapsed again (cf. Swinburne, 2004, p176). Many more examples of cosmological fine-tuning can be adduced. Yet here we are. The odds of us being here are infinitesimal, and so, our existence is surprising (Holder, 2002, p309).

That, then, is the basic case for thinking that our universe is improbable. The physicalist has three sorts of response. First, she may deny what has just been argued; that a more adequate reflection on the data would suggest that a life capable universe is not very improbable. Secondly, a physicalist may take a more skeptical attitude towards the considerations that have been presented. It might be claimed that given how little we still know about the universe, we have no way of knowing how improbable a life capable universe like ours is. Finally, and perhaps the most common response amongst physicalists, is to suggest that there are multiple universes. In such a scenario, a universe like ours would have been quite probable. This is called the Multiple Universes Theory (MUT) (Bostrom, 2002, p11).¹³² We discuss these three responses below (though not in that order).

¹³⁰ Other writers give different ‘fundamentals,’ such as the electroweak and weak nuclear forces, and gravity. Whichever list is selected as ‘fundamental’ is irrelevant to the basic point: that the forces or constants seem fine-tuned.

¹³¹ Davies, 2007, p156; Dawkins, 2006, p141

¹³² The conjunction of the MUT and Anthropic Principle are meant to completely answer why we are here (Hacking, 1987, p338). This will be discussed in a bit more detail later on.

1. Is our universe in fact very improbable?

Not all cosmologists hold the view that our universe was improbable. Stenger and Vilenkin, for example, reject it (for different reasons). Stenger has found, in using his simulation called MonkeyGod, that there are at least 1×10^{500} possible universes that would support life, given the random set of possible combinations of the four fundamental forces (Stenger, 2009, p89; 2011, p23). This means that contrary to what theists might argue, the set of combinations of fundamental forces are not as strictly limited as one might assume. “One [c]ould hold that the fundamental constants could take a wide range of values and still be life-permitting.” (Monton, 2006, p417).

Indeed, for all we know, the physical constants of the universe may, by logical necessity, have to be a certain way, and those values may well just be the same values that are required for life capability. If this is true, it obviates any claims for specific selection of our kind of universe, the need for multiple universe models, and it also does not need us to imagine alternative combinations of the fundamental forces. Fine-tuning may well be present, then, from the beginning (cf. Hacking in Whitaker, 1988, p262). Stenger makes this argument in his *Fallacy of Fine Tuning*. In that book he illustrates, complete with mathematical derivations, just how the fundamental constants are related to each other and how they, in a sense, have to be the way they are.¹³³

What this shows is that there are plausible physicalist responses to the claims of fine-tuning other than the Multiple Universe Hypothesis. Moreover, as we mentioned, Vilenkin has a different reason for rejecting the claims of fine-tuning. We discuss Vilenkin’s rejection below, once we’ve introduced the basic concept of the multiple universe hypothesis, as Vilenkin’s response requires the reader to understand the multiple universe hypothesis.

2. Multiple Universes

Physicalists typically respond to the claim that our universe is fine-tuned with the multiple universe hypothesis, also called the Multiple Universe Theory (MUT) or “many worlds interpretation” (MWI).¹³⁴ The argument goes as follows: If there are (or were) multiple actual universes, perhaps with some variation in their fundamental constants, then the probability of there being a universe like ours would be raised. The more universes there are, the more probable it is that one of them at least will be, or would have been, capable of supporting life.

¹³³ This book is contested by Barnes, 2011, op. cit. The debate is very technical and need not interest us here; the key point is that there are at least some atheist authors who do not accept the premise that P(e) is low.

¹³⁴ Dawkins, p145; Leslie, 1989, p18 et seq.; 2000, p8; Juhl, 2006, p269; Stenger, 2011, p22; White, 2000, p261; Vilenkin, 2006, pp115-116.

Even Leibniz, with his “world ensemble,” and Hume, supposing a trial-and-error creation process, have suggested similar ideas to this (in Davies, 2007, pp95-6). If the MUT were true, it would be very likely that an ordered universe just like ours would be amongst these universes.¹³⁵

The idea of MUT derives from an interpretation of quantum mechanics originally proposed by Hugh Everett (1957, pp8-9, cf. Holder, 2002, p301; Vilenkin, 2006, pp115-116). In brief, and to put it as simply as possible: if the universe has a wave function, then this

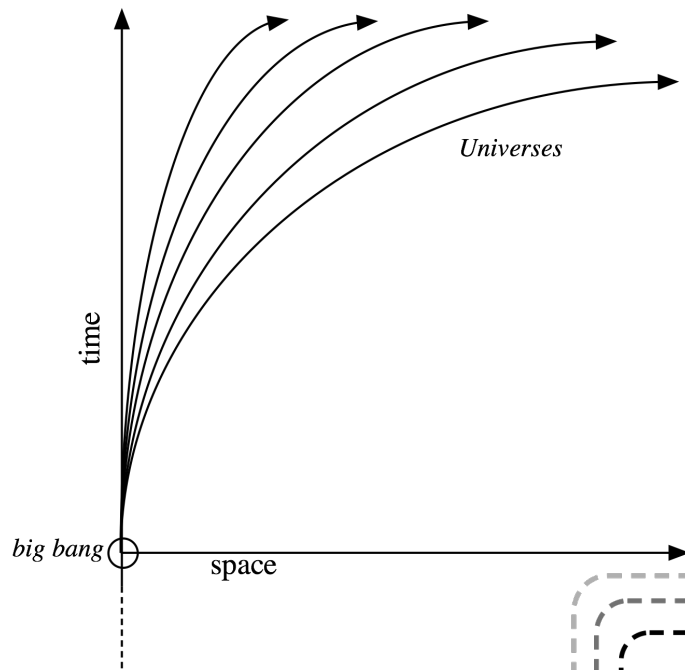


Fig. 5. Multiple Universes Theory

means that the universe itself could have multiple states which are simultaneously actual. And hence, there may right now be multiple actual universes, as shown in Figures 5 and 6. Figure 5 shows the universe splitting into multiple trajectories after the big bang in the “Inflationary” period. It is however, primarily the cosmic inflation hypothesis and string theory considerations, which

means that the universe itself could have multiple states which are simultaneously actual. And hence, there may right now be multiple actual universes, as shown in Figures 5 and 6. Figure 5 shows the universe splitting into multiple trajectories after the big bang in the “Inflationary” period. It is however, primarily the cosmic inflation hypothesis and string theory considerations, which

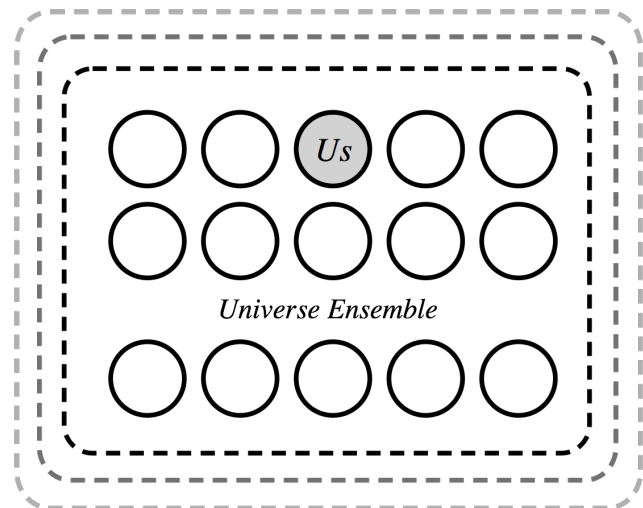


Fig. 6. Universe Ensemble

¹³⁵ These parallel simultaneously-existing universes are also known as the Universe Ensemble and Carter Universes (Hacking, 1987, p331; White in Holder, 2002, pp295-6).

pocket universes. It is also possible that there is even now a state of continuous inflation, in which new bubbles — universes — are being made all the time (Davies, 2007, pp94-95); compare this to Figure 6.

So, how then does this theory guarantee that our universe exists? Consider again the idea of buying multiple lottery tickets (Leslie, 1988, p271). Each ticket is a potential winner, but not an actual winner unless selected (Holder, 2002, pp307-9). By buying multiple lottery tickets, we increase the odds of picking the winning ticket, or raising the probability of winning. The same applies to the universe ensemble. Were there more than one actual universe, then there would be a greater probability that one of those universes would have been life-capable (White, 2000, p262). Even though an individual winning ticket is rare (life-capable universes are rare), as long as all the tickets are taken (all universes exist), it is guaranteed that one ticket is the winner (our universe exists) (cf. Leslie, 1989, p24).

Consider another analogy. Suppose a dart-player who has never played before hits a bulls-eye on his first throw. We'd be astounded by such an event. Theists argue that our universe is like that; of all the large probability space (the dart board or universe ensemble), the only hit (actual universe) was the bulls-eye (a habitable universe). But, we can reply, the analogy can be extended. Imagine that the dart-player has an infinite amount of time to keep throwing (generating a series of universes). If this were the case, we would no longer be surprised when, after a few billion years, the dart-player has hit a large number of bullseyes (life-capable universes). Naturally, unlike a dart-player, the UGD doesn't "get better" at making universes; the probability of any particular universe coming out of the UGD as life-hospitable is the same for any instantiation of a universe.¹³⁶ But even if the dart-player can't learn, the chances are that given enough time, he'd have thrown enough darts to accidentally hit the bullseye a large number of times.

Now suppose that every time the dart-player throws, he throws two handfuls of darts at the same time. Under those circumstances, we'd be much less surprised by a bullseye on the first throw (since there were so many darts). These thought experiments, then, illustrate the two models of multiple universe theory and how they are meant to answer the challenge of the fine-tuning of the universe. That is, a dart-player with an infinite amount of time, throwing a dart over and over, represents a time series of universes (one after the other). The second example, throwing a handful of darts, represents an ensemble of parallel universes. Either model, the idea goes, will raise the probability that our universe would exist.

Using Bayes' Theorem, Holder shows that if you take M as the hypothesis of multiple universes, and e as our universe, then $P(e|M)$ is a sum of all the probabilities of all other universes that exist, or have existed. In such a case, he argues, the probability of our universe

¹³⁶ To suppose otherwise is to be guilty of the Gambler's Fallacy — more on this in Chapter 10.

(e) existing, would be high (Holder, 2002, p300). Thus, Holder and many cosmologists conclude, if MUT were true, our universe would not be surprising.¹³⁷ Our universe, on this model, is just one universe in an already-existing ensemble. And hence our universe is quite likely to exist, because the ensemble is so big. Consider, then, the following two premises:

- a) **MUT:** There are many more universes than this one, each having a specific combination of the fundamental forces. Yet due to the large number of universes, a universe with just our specific combination of fundamental forces must have come to be.¹³⁸
- b) The **Anthropic Principle (AP):** Since we are now here observing the universe, we have to be in a universe which is capable of supporting life.¹³⁹

These premises (a) and (b) deductively and jointly lead to the conclusion that we would find ourselves in an ordered universe — without the need for any designer (Hacking, 1987, pp337-8, p340; Davies, 2007, p237). The AP says that the universe in some sense *must have* been such as to support the formation of life, since we *already* exist.¹⁴⁰

Let's take the AP as a Bayesian argument, where *e* is the evidence that the universe supports life, with background knowledge that there is life, and that we could only be in a spacetime region which supports life (AP). If AP is true, $P(e|h \& AP) = 1.0$; where *e* is also old evidence (Monton, 2006, p415).

“Why do we exist? Because we are a possible universe, and all possible ones exist. Why are we in an orderly universe? Because the only universes that we could observe are orderly ones that support our form of life. In an even stronger way than with Hume, nothing is left to chance. Everything in this reasoning is deductive.” (Hacking, 1987, p338).

We do not discuss the AP further in this thesis for reasons of space, as it is, to a large extent, a tautology (“We can only exist where life can exist”).¹⁴¹ The combination of the AP and inflation theory, however, can lead to a further refinement of the AP, which Vilenkin calls the

¹³⁷ Holder does however argue that the sum of probabilities should be a bit less than one, as “on the grounds of simplicity, ... it is *a priori* probable that there is absolutely nothing.” (Holder, 2002, p298).

¹³⁸ Hacking, 1987, p337, p340; Juhl, 2006, p269; Holder, 2002, p300

¹³⁹ Leslie, 1988, p269; Hacking, 1987, p337, p340; Juhl, 2006, p269, p273; White, 2000, p261, p265. The latter claim (b), the “Anthropic Principle,” (AP) was also coined by Carter (Hacking, 1987, p339).

¹⁴⁰ Tipler, 1982, p37; Barrow, 1983, p149; Hacking, 1987, p340; Bostrom, 2002, p6; Carter, 1974, p129.

¹⁴¹ “The anthropic principle ... applies to the Wheeler story too, and indeed to anything at all, as is the habit of tautologies. The ‘explanation’ of why we are observing an orderly universe is, if you like, that we exist; that is an obfuscating banality that applies equally to Carter, to Wheeler, to Epicurus, and to creationism.” (Hacking, 1987, p341).

Principle of Mediocrity (POM). Let's discuss that first before we consider other models of the multiple universe hypothesis.

3. The Principle of Mediocrity

As argued above, a physicalist may take a more skeptical attitude towards the considerations that have been presented. It might be claimed that given how little we still know about the universe, we have no way of knowing how improbable a life-capable universe like ours is. Another interesting strategy for resisting the claim that our universe is improbable is provided by Vilenkin (in Stenger, 2011, p228-9; and Vilenkin, 2006, p140 et seq.) He argues that if our universe is 'mediocre' or 'normal', then, using normalised probability curves, it would indicate that universes like ours would most likely be of a common sort, not requiring divine selection. We have to assume that our universe is 'abnormal' before we can argue that it is improbable, in some sense. We are much more likely, if our universe is in some sense "standard," to be in the middle of the bell curve than on its extremities. Consider Figure 7 (based on Vilenkin, 2006, p141). Clearly, the chances are very high that we would exist in the large region of the curve from "Bad" to "Good". And indeed, most universes would fall into that region. The same would apply to the cosmological constants; the odds of them

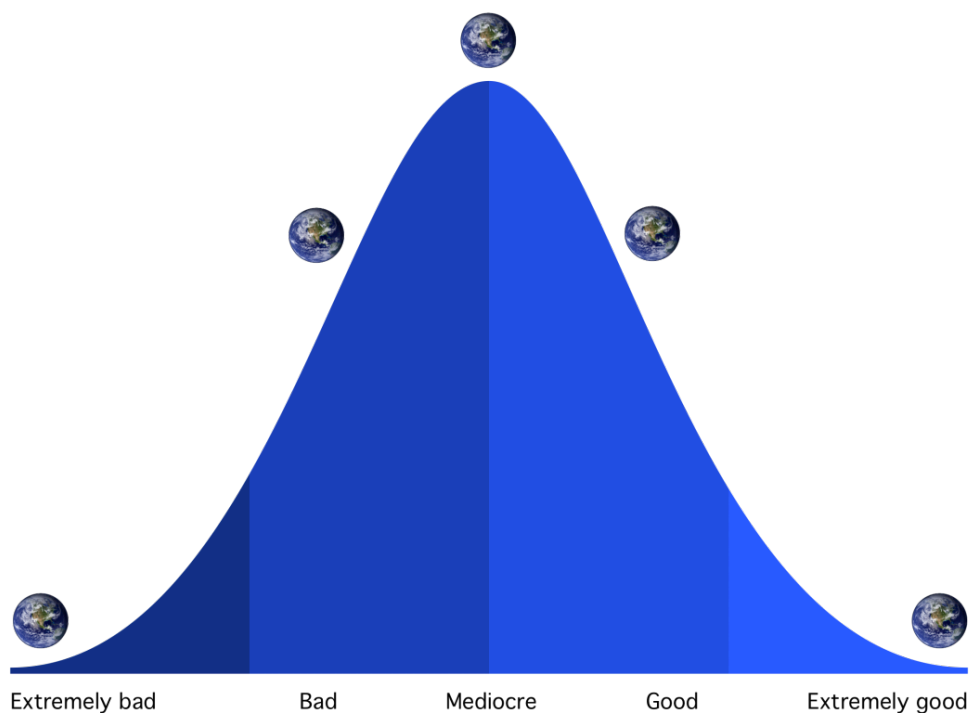


Figure 7. Probability curve of a universe like ours

having certain specific life-enabling values, given that we exist in a life-capable universe, is high, if their values fall on a normal bell curve (2006, p142). Therefore, Vilenkin concludes,

our universe is mediocre or commonplace (2006, p140 et seq.). Another way to express the idea is that if we take an average value of the relative frequency of observers in a universe ensemble (or group of island universes), we will find that they mostly cluster where galaxies, life-capable planets, etc., cluster. “The Principle of Mediocrity,” Vilenkin tells us, “says that we are most likely to find ourselves amongst these observers” (2006, p146).¹⁴² So, again, we should be in the larger part of the bell curve.¹⁴³

Vilenkin’s argument (2006) is tied to his version of the theory of inflation — that the universe rapidly expanded after the big bang and continues to do so in multiple uneven regions or patches. In this model Vilenkin, like others, indicates that the inflationary model implies the existence, and indeed continuous formation of, multiple “island” universes (2006, pp81-82). Due to limitations of quantum mechanics, where there can only be a finite number of discrete states of observable universes or “O-regions” (2006, p106), Vilenkin argues, each universe can have at most 10^n finite and distinct histories (in his 2006 book he gives a number between 90 and 123 for n , and in a recent online article,¹⁴⁴ he gives 150).

“[I]t follows from quantum mechanics that there is only a finite number of histories that can unfold in any O-region... we arrive at the inevitable conclusion that every single history should be repeated an infinite number of times. According to quantum mechanics, anything that is not strictly forbidden by conservation laws has a nonzero probability of happening. And any history that has a nonzero probability of happening will happen — or rather has happened — in an infinite number of O-regions! ... Yes, dear reader, scores of your duplicates are now holding copies of this book. They live on planets exactly like our earth...” (Vilenkin, 2006, pp111-112).

Consider the matter of the probability of finding a particular piece of data within a statistical interval. If there are infinitely many universes similar to ours (life-capable), or indeed even identical to ours because of the limited numbers of possible histories, it means that statistically speaking, our universe is mediocre, because there are a limited number of possible histories which have happened an infinite number of times within the infinite data set of all universes. In effect, this is the same argument as MUT. Now, the reader may recall that Stenger reports a figure of 10^{500} life-capable universes (Stenger, 2009, p89; 2011, p23). If Vilenkin is right, and there are at most 10^{150} unique possible universes or O-regions, it

¹⁴² Originally appeared in Garriga, J., Vilenkin, A., 2001

¹⁴³ The reader might find it mysterious where the normal distribution comes from. The justification for this technical and contested. However, if a position like this could be made to work, it would justify the view that although some universes are improbable, universes like ours are not.

¹⁴⁴ https://www.edge.org/conversation/alexander_vilenkin-the-principle-of-mediocrity — accessed 10 Dec 2016

follows that not only is our universe not unique, but that it has existed, exactly like this, many times over. From this it follows, our universe is not surprising; $P(e)$ is in fact high.

“Now we have been robbed from this last claim to uniqueness... With humankind reduced to absolute cosmic insignificance, our descent from the centre of the universe is now complete.” (Vilenkin, 2006, p117).

“Postulate that the universe is infinitely old, but has only finitely many particles. Postulate that configurations of particles occur by chance, but that there are only finitely many. Postulate that transition times between configurations are finite ... Well then, *every possible configuration of the universe will occur, indeed recur indefinitely often...* All possible universes come to pass, hence ours does.” (Hacking, 1987, p336 [my italics]).

Divine Indeterminacy is not the same as MUT

It is important to briefly emphasise that we must not confuse MUT with *possible* universes under divine indeterminacy (DI), which we met in Chapter 8. Recall: this is the idea that there were many millions of possible universes that God *could* have chosen to actualise, each of which would have been good enough. And, DI objects, this means that theism does not explain our universe, because there are so many possible alternatives for God to have selected ours from. MUT, however, does something different to DI. What MUT does is proposes that there are now at this present time, a large number of *actual* universes. Since large numbers of universes are real, one like ours is very likely to be amongst them, and hence, its probability of existing in the set was very high, even though the frequency of universes like ours *within* the set would be low.

Pulsating Universe Theory (PUT)

An alternative model to MUT is the Pulsating Universe Theory or PUT. This model is also known as the Wheeler Universes theory (Hacking, 1987, p331; White in Holder, 2002, pp295-6) or Wheeler’s Oscillating Universe Theory.¹⁴⁵ This model claims that there were, and will be, other universes, before and after ours, existing one at a time (cf. Holder, 2002, pp295-6). At the end of the life of a universe, it collapses in on itself (in a “Big Crunch”), generating immense energetic tension, which is then released again as another “Big Bang,”

¹⁴⁵ Giancoli, 1990, p912; Wheeler in Holder, 2002, pp295-6; Bostrom, 2002, p16; White, 2000, p263; Hacking, 1987, pp336-7, Holder, 2002, pp295-6; Leslie, 1988, p269; Xia, et al (2014).

forming a new universe. Each collapse-bang cycle is called a ‘bounce’. That new universe then ultimately collapses in on itself, etc., *ad infinitum* (Bostrom, 2002, p17). The idea is this: if the universe had all the time necessary, inevitably, one of those combinations of matter would be our universe. Recall the dart-thrower analogy now. In the case of MUT, we’re dealing with the case where multiple darts are thrown at the board simultaneously. In the case of PUT, however, the dart-thrower just has a large amount of time to throw one dart at a time, until he “gets it right”.

A concern worth mentioning around PUT is whether the concept of “time” is meaningful, if the entire universe (comprising space-time) collapses in the “big crunch”. This is tricky to answer. Perhaps it’s easiest to say that during the life-span of each universe, each universe has a time scale, or an arrow of time, which goes from past, through present, to future. However, as the universe then collapses in a “Big Crunch”, time becomes (briefly) meaningless, within the confines of the singularity. Suppose, then, that the singularity occupies some very small point, in which space and time are meaningless concepts. This means that the “time” expanse in the singularity phase is approximately zero. Hence, it is not inaccurate to represent the series of bounces on a continuous time scale as shown in Figure 8, since while the universe(s) exist, they have time scales.

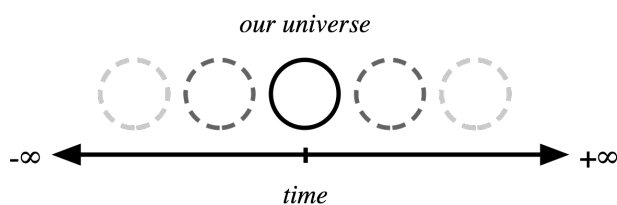


Figure 9. The Series of Universes

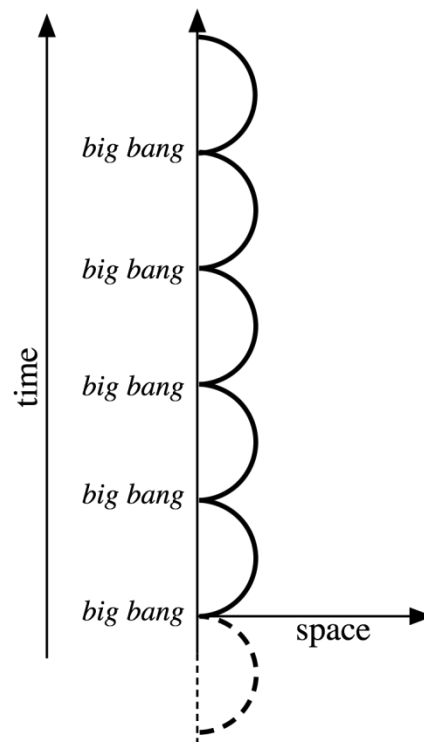


Fig. 8. Pulsating Universe Theory

This model seems simpler in terms of Occam’s Razor because: (a) it is only postulating *one universe at a time*, and (b) we may be able to discover that the universe has sufficient energy and gravity to pulsate, and therefore raise this theory’s probability. The question of whether there is only one universe, and whether the universe pulsates, is something which depends on how much matter there is in the universe. This is called “the critical density of the universe” (Giancoli, 1990, p909). If there is too little mass, the universe will expand indefinitely, because it will lack sufficient

gravitation to fall back in on itself when the initial momentum of the original Big Bang has worn off, say, due to gravitational pull (Friedmann in Vilenkin, 2006, p24, p47). This is called the “open” or “flat” universe, and it ends in a state known as “heat death”, wherein the universe is at maximum entropy, and all stars, etc., have collapsed into black holes (von Helmholtz in Vilenkin, 2006, p25). On the other hand, if there is too much matter in the universe, it will collapse in on itself and form an eternal black hole; its own gravity would be too strong to allow it to explode again (cf. Stenger, 2011, p103, Vilenkin, 2006, p47). Indeed, PUT has been recently supported in papers by Gielen and Turok (2016)¹⁴⁶ and Xia et al. (2014).¹⁴⁷

The argument of PUT is therefore that *if* the universe has just the right amount of matter, it could pulsate. PUT has all the apparent advantages of MUT in seeming like a good way to raise the probability that our finely-tuned universe would arise, without the extravagance of postulating that there *are now* potentially infinite numbers of existing universes, each requiring an explanation as to its origin.

Quantum Tunnelling and PUT

One variety of PUT would be to suggest that the universe is a loop (Stenger, 2011, p133-44). On the model of quantum tunnelling (Stenger, 2011, p138) we can visualise time as a continuous circle, rather than as an infinite straight line. This model of time allows for a possibility of pulsation too, in that there is only one universe, and it is a closed loop. As the universe reaches its maximum extent, the universe collapses back in on itself.

In this chapter and others we’ll talk occasionally of a ‘memory effect’. By this, I mean that some information is preserved between pulsations, enough to carry the universe’s properties through each ‘pulse’. ‘Memories’ carried through each pulsation might be things like fundamental particles, their basic masses, fundamental quantum laws, forces, etc. So, if there is a memory effect, we’ll not be surprised when every universe is life-capable; however, if there is no memory effect, then each universe might be different. The idea behind the memory effect is the conservation of matter-energy. If there’s a fixed amount of matter-energy in the universe, then it doesn’t really matter how many times the universe pulsates, it will have the same amount of matter-energy each time, and hence, possibly, the same laws,

¹⁴⁶ “... The evolution describes a “perfect bounce”, in which the universe passes smoothly through the singularity. ... This picture provides a natural, unitary description of quantum mechanical evolution across a cosmological bounce. We provide evidence for a semiclassical description in which all fields pass ‘around’ the cosmological singularity along complex classical paths...” (p1) ... “which avoid the classical big bang singularity.” (p5).

¹⁴⁷ The paper argues that recent evidence regarding the Cosmic Microwave Background radiation can be explained and made coherent if we make certain assumptions, one of them being that the universe pulsates.

and same chances of life. If there is a memory effect, then, PUT actually guarantees a life-capable universe every time. Matter, and hence “memory” of the universe’s configuration, could therefore “tunnel” through $t \approx 0$ as shown in the diagram of the BGV model, Figure 10. This argument, if correct, would also show that the question of what came “before” is meaningless.¹⁴⁸ The universe, on such a model, would have just always existed (Stenger, 2011, p141, p129, p142) and always been life-capable, as a brute fact.

Problems for MUT and PUT

The above discussion is meant to show that, where e is a life-capable universe like ours, and M is either MUT or PUT, $P(e|M)$ is high, perhaps even 1.0. In the next chapter we will consider in more detail whether we can infer from this that $P(M|e)$ is high; that is to say, whether the existence of our universe does indeed support M . But before we do that, we need to turn to some more fundamental objections to M . Some of these criticisms are meant to show that $P(M)$ is probably low, and some of these criticisms are meant to

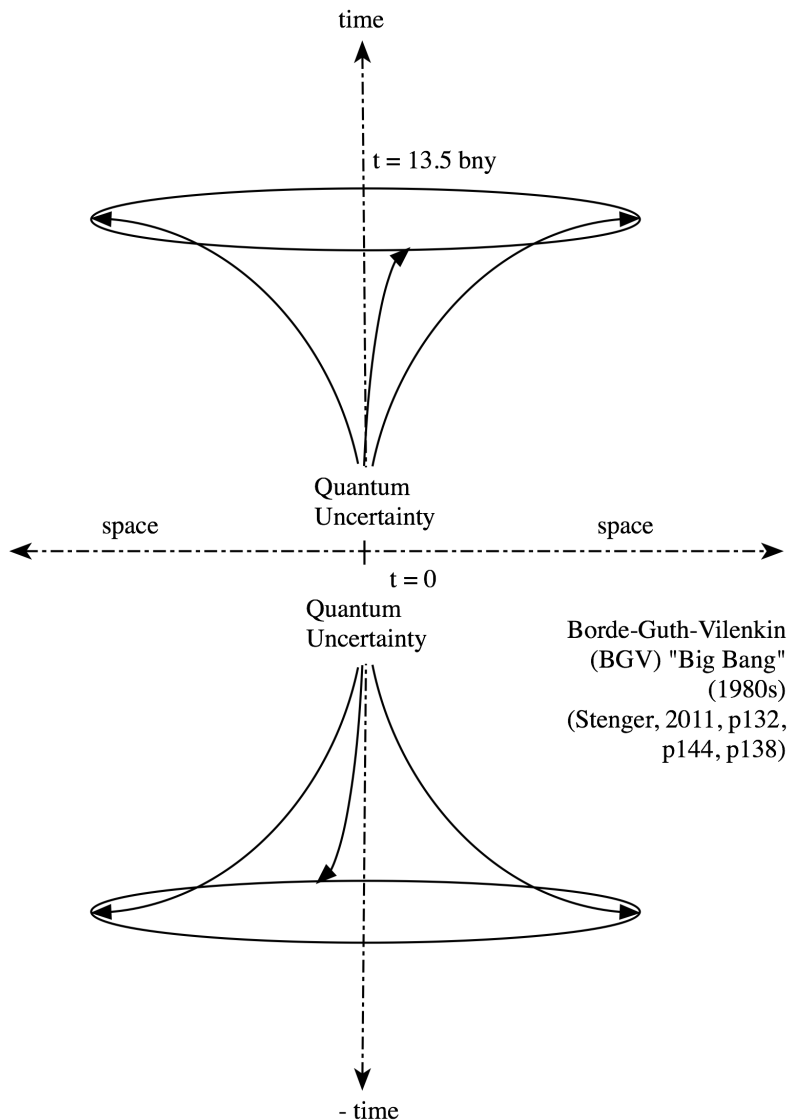


Fig. 10. Borde-Guth-Vilenkin model

¹⁴⁸ Narlikar, 1992, p369 argues that there can be no literal $t=0$.

show that M is not an explanation of the truly important facts. In the discussion below we'll use "PUT" and "MUT" so as to be clear which model we mean.

1. *That MUT is unreasonably complicated*

Swinburne presents us with this argument, which I suspect many of us have thought when we first heard of MUT:

"It would be the height of irrationality to postulate innumerable universes just to explain the particular features of our universe, when we can do so by postulating just one additional entity—God" (Swinburne, 2004, p165).

MUT is objectionable, then, to our principle of simplicity (Holder, 2002, p297, p310; Swinburne, 2004, p185; also in Stenger, 2011, p292) and if we were to accept that greater complexity implied lower prior probability, we might think this would lead to P(MUT) being very low indeed. Theists might argue that MUT might be the most complex possible hypothesis, and therefore have a lower prior probability than theism. MUT does indeed, *prima facie*, seem "premature," "exotic" and "extravagant" (Juhl, 2006, p272, p273). MUT postulates more entities than are necessary to explain the observed facts. "Theists," Stenger says, "scoff at [MUT] saying that it violates Occam's Razor" (2011, p42, p292). But science does not require that we have to accept the least complex hypothesis, as we discussed at length in Chapter 5. As we saw in Sober's 1994 article, science does not have a particular preference for quantitative parsimony (i.e. Occam's Razor). Instead, science goes where the evidence goes. Moreover, in our earlier chapters, we argued that there is no strong connection between prior probability of a hypothesis and the simplicity of a hypothesis. It is irrelevant how complex MUT is. Moreover, MUT is more *qualitatively* parsimonious than theism since it involves postulating many different entities of the same kind: universes. Whereas theism must also postulate an entity of a different supernatural kind — God.

Secondly, it is not clear theism is more *quantitatively* parsimonious with respect to physical entities anyway (Stenger, 2011, p292); there's nothing in theism to say that God shouldn't have, or didn't, create multiple universes. As Holder observes, if we can consider the dead-ends and failures of evolution as just part of the glory of nature and God's creation, so we might consider all the varieties of multiple universes more of the same (Holder, 2002, p302). After all, as Swinburne himself tells us, having more types is just better (Swinburne, 2004, p102, p116, p122, p131). Therefore, it is not clear that MUT is definitely more complex or extravagant than theism, or even incompatible with it (Stenger, 2011, p24). Nor

do we need to assume that God would stop creating once he had created our universe. Swinburne says: “[God will] inevitably go on making more good things...” (2004, p117).

Furthermore, even if MUT is complex, God still would be more complex than a multiverse, as argued in the **DCA** offered in Chapter 6: Each universe is simpler than God, and therefore each universe would be more probable than he is (Dawkins, 2006, p146). Whether we are talking about an infinite number of universes, or an infinite God, it seems that there is still no simplicity advantage to theism. An infinite God with an infinite number of mental states, is as complex as an infinite number of universes, particularly since no matter how many universes there are, an omnifarious God would know about all of them and have them in his mind. And if MUT is only proposing a large number of universes, rather than infinite numbers of them, then theism’s infinite God would certainly be more complex. In short, God would never be less simple than MUT, due to **DCA**. These considerations at the very least show that there is no good reason for thinking that the prior probability for MUT is lower than that for theism if complexity is tied to $P(h)$ — which we’ve also disputed.

2. The impossibility of verifying MUT

What defines “another universe” is that it is separate in all its laws, features, space and time, from this universe. We can thus never know whether there are multiple universes because we are forever bound to this one; we could not travel between them or discover them. Hence they are inaccessible to us, and MUT is sheer speculation and unverifiable (Holder, 2002, p310; Davies, 2007, pp94-5). However, a recent article suggests that there may indeed be a way to detect other universes if they “collide” with ours and interfere with the distribution of Cosmic Microwave Background Radiation (CMBR).¹⁴⁹ Perturbations in the CMBR also match the predictions of inflation (Vilenkin, 2006, p91). So MUT may be testable. However, even if MUT is not directly testable, it is no worse off than theism in this regard. MUT might, like theism, have no independent evidence beyond the existence of the universe. This means, as with theism, the overall plausibility of the theory must depend heavily on the prior probability and as was argued in Chapters 3 and 5, it seems difficult to see how this could be fixed in some objective way. At least MUT is derived from strongly-supported scientific theories in k , and hence, should have a higher prior probability in the context of k .

Now, the objections we have looked at so far concern, in certain ways, the prior probability of MUT. But another set of worries must be addressed, namely around whether MUT is explaining the right thing.

¹⁴⁹ See Feeney, et al., (2011), also in Stenger, 2011, p229, and Vilenkin, 2006, p90.

3. *MUT does not explain why there is an orderly law-governed world.*

Even if there are multiple universes, Swinburne argues, those universes too, would be governed by regular laws, and those features and laws would be *a priori* improbable. Therefore even if there were additional universes, they would need theistic explanation for their existence and their order (Swinburne, 2004, p165, p187).

This argument seems *prima facie* convincing, however, it is difficult to see why theism is at an advantage here. God is surely supremely orderly, so if there is a general worry about why there is order rather than chaos, appealing to an orderly God is as explanatorily redundant as MUT. Why should God be orderly except for some *a priori* considerations that he just ought to be so?

4. *MUT suffers from the same problem as any other brute fact.*

One might then worry about how the multiverse came about. If MUT purportedly explains the life-friendliness of this particular universe, we're still no nearer an explanation as to why there are multiple parallel universes rather than nothing (Davies, 2007, p222, p232, p238). I believe that this problem gets to the heart of the matter. No matter what model we prefer — MUT, or theism, or a single universe big-bang, or PUT, etc., we have to accept that there is some brute fact, a contingent and inexplicable stopping point of explanation — be it theism, PUT or MUT. The only advantage to MUT over a single universe model, is that it gives us an explanation for why ours happens to be life-capable. MUT doesn't answer the theist's more basic question of why anything should exist at all. But equally, postulating the existence of God does not do that either. For we can just as well ask *why God should exist at all*. Unless the theist accepts or puts forward the Ontological Argument, theism offers no epistemic advantage.¹⁵⁰

In sum, these objections do nothing to show MUT is less probable than theism. The first two arguments either give us no reason to assume MUT is less probable than theism. Where real problems are raised for MUT, for example, with regard to fixing the priors, these problems equally affect the theist, as we argued at length in the first half of the thesis. Much the same can be said of the arguments which are meant to show MUT is explaining the wrong thing. If we want an explanation of orderliness in general, or why there is something rather

¹⁵⁰ Obviously many theists will claim that God necessarily exists and so for that reason God is an acceptable end point in our explanation. However, we (and Swinburne) have rejected these arguments. Without such a justification there is an exact parallel between the theist and atheist position. Both have selected a contingent stopping point to explanation.

than nothing, Swinburne's God is equally explanatorily ineffective, since we have no reason to believe that God just ought to exist, particularly a contingent God.

5. A Scientific Problem for PUT

Before we conclude, we must point out a challenge for PUT. Davies argues that if the universe had just 'always' existed (as is suggested, in some sense, by PUT), it would have reached the end of its life by now, and suffered heat death; the reason being the Second Law of Thermodynamics. Stars burning, black holes collapsing, are irreversible processes that lead to heat death. Therefore, were the universe infinitely old, it would already be in heat death, since the periods of time required for stars to burn out and black holes to collapse, is much less than an infinite period of time (Davies, 2007, pp82-83).

But this response is already addressed above in the discussion of the "big crunch". Davies is envisaging the case of the mass of the universe being not great enough, i.e. the open universe. Currently, given our knowledge of the amount of matter in the universe, it seems that the universe is indeed "open," i.e., it will eternally expand (Giancoli, 1990, p908 et seq.; Stenger, 2011, p96), and will suffer heat death. But scientists certainly have not seen all the matter there is, and there is evidence in favour of dark matter (Giancoli, 1990, p909), which might bring the mass of the universe in line with PUT's requirements. Stenger, for example, says that the bulk of the substance in the universe in present theory, seems to be dark matter and dark energy at 96% (Stenger, 2011, p98). Expansion of the universe could, furthermore, be due to dark energy (as opposed to momentum from the original Big Bang), as dark energy is hypothesised to have a reverse gravitational effect (Stenger, 2011, p99). And if PUT turned out to be true, it would be unsurprising to discover that at some stage of the existence of the universes, that an orderly universe was formed (Holder, 2002, p296). But further problems with PUT are discussed in the chapter that follows, where we will see that Hacking feels that PUT involves a fallacy of probabilistic logic.

Conclusion

There is no good reason to suggest that fine-tuning of a universe was necessary, or even probable, unless we accept the theistic claim that God would create, and fine-tune the universe so as to create us, all of which we rejected in the previous chapter.

If there are many universes, it's highly probable that *some* universe would contain life, but it's also apparent that the theistic design hypothesis would not render our universe more probable under that scenario (White, 2000, p273-4), as the design hypothesis is superfluous: under MUT/PUT, we would expect that many universes would be, or would

have been, life-supporting. If we consider the models discussed in this chapter, we see that MUT in particular is a consequence of quantum mechanics, and therefore is not a mere philosophical contrivance to reply to the theist. Hence, MUT seems like it will help explain why our universe is life-capable. However, MUT and PUT both nonetheless fail to answer the theist's more basic question of why anything contingent should exist at all. Swinburne, in particular, as we saw, rejects the Ontological Argument; that is, he thinks God is contingent. So, the atheist can reply: Why should such a contingent God exist at all? The answer that God is "simpler" has been repeatedly rejected in previous chapters and this one. MUT/PUT offers a brute fact just in competition to theism's brute fact; so at best, it's a question of which hypothesis, theism or multiverses, has the highest prior probability.

Furthermore, as we saw, there's nothing to say that God couldn't create a multiverse *so as* to enable life to exist. A theist could simply say "God made the multiverse ensemble too". So the helpfulness of MUT/PUT as a response to theism ultimately depends on how we weigh up the prior probabilities of the competing hypotheses (Holder, 2002, p307). And to make that argument, we must assume that MUT/PUT and theism are in competition. If we assume that God created the multiverse so as to enable life, then we're back at square one.

We now turn to look at some nuanced problems involved in trying to argue that the existence of this universe makes either MUT or PUT more likely.

10. Does the Pulsating Universe Theory involve an Inverse Gambler's Fallacy?

Introduction

As we saw in the previous chapter, it is hypothesised that there are a myriad universes (a “multiverse”), which guarantee that our specific universe would arise through trial and error, or through sheer probability.¹⁵¹ These models are offered by cosmologists as replies to the claim that the universe has been fine-tuned for life by an Intelligent Designer (Holder, 2002, p295). As we saw, the two models are the Carter Multiple Universe Theory (MUT) and the Wheeler Pulsating Universe Theory (PUT).¹⁵² We saw in the previous chapter that we did not feel that these models offered a significant advantage over natural theology since in both the case of natural theology and in the case of physicalistic cosmology, we have a brute fact. However, what the models do is at least attempt to answer the question of why our universe is life-capable. And perhaps that will satisfy some theists.¹⁵³

Hacking (1987, 2008) however, is of the view that PUT involves a fallacy of probabilistic reasoning, which he calls the Inverse Gambler's Fallacy (IGF). Thus, Hacking argues, we should prefer Carter's MUT over Wheeler's PUT. In this chapter, then, we ask whether Hacking is right; that PUT involves a probabilistic fallacy. If it does involve such a fallacy, PUT would not be a compelling reply to the theist. This chapter argues further, in agreement with White (2000), that the problem affects MUT as well, provided we grant both Hacking and White certain plausible assumptions, and therefore neither PUT nor MUT are adequate replies to the theist. To cast this in Bayesian terms, what Hacking and White argue

¹⁵¹ Hacking, 1987, p332; cf. also Holder, 2002, pp299-300; and White, 2000, p261

¹⁵² Hacking, 1987, p338 attributes PUT to Boltzmann and Wheeler, cf. also Holder, 2002, pp295-6.

¹⁵³ In review of this thesis, Bishop argues: “This chapter seems to take it that PUT not only offers a reply to the theist's fine-tuning argument, but that it also explains the existence of a life-capable universe, making it more likely than it would be in any case. But I don't see that there's any justification for - or, indeed, point in - this further explanatory claim. PUT (or any version of the multiverse claim) is invoked to explain how, given that the chance of our kind of universe existing is conceded to be very low indeed, ‘the selection’ of a universe of our kind might nevertheless not stand in need of any explanation (since a vast number of universes actually exist, there is no such ‘selection’). [The] discussion here... seems dialectically misconceived.”

In response, we might say the following. What is the fine-tuning argument? It amounts to the claim that for theism h , $P(\text{elh}) \gg P(\text{el}\sim h)$. How could a physicalist respond? Only by arguing that the inequality is untrue, by trying to show that where M is MUT or PUT, $P(\text{el}M\&\sim h)$ is high. And so presumably if you support M , you also think that $P(\text{el}\sim h\&\sim M)$ is low. In other words, in order to think M is a response to the fine-tuning argument, you must think that M makes the existence of a life-capable universe more probable. As we shall see below, the actual argument of multiverse theorists seems to rest on a subtle fallacy. Perhaps this fallacy is what Bishop is alluding to; but to make that point precise we need to characterise more carefully exactly what is meant by the evidence, e .

is that the existence of our life-capable universe, e , in no way increases the chance that MUT or PUT (M) are true.

Analogies for Multiple Universes

There are a number of analogies for multiple universes which occur in the literature, such as the analogies of a dart-thrower, lottery tickets (Leslie, 1988, p271, Holder, 2002, p309), a deck of cards (Leslie, 1988, p272; Hacking, 1987, p332), and rolling a double-six at dice (Hacking, 1987, p332, Leslie, 1989, p1, p6), which we saw in the previous chapter. A model that I prefer for showing the difference between MUT and PUT, and the effect of probability on those models, is to consider *eggs*. Think of a carton of eggs, with many rows. Now think of a very large stack of these cartons. That is MUT. Think now of a very long moving conveyor belt with eggs arranged in single file. That is PUT. In both cases, only some of the eggs are fertilised. A fertilised egg is like our universe, life-capable. An unfertilised egg corresponds to a lifeless universe. The trouble with the examples used in the literature is that they're often unclear about which model (PUT/MUT) is under discussion.¹⁵⁴ We'll clarify, then, which model we're referring to in each case when we use an analogy. For convenience, moreover, we will refer to whatever it is that causes the universe to exist as the Universe Generating Device (UGD). Furthermore, we will suppose that the UGD is a fair device; that is, it has no specific bias for or against life-capable universes.

The Gambler's Fallacy and the Inverse Gambler's Fallacy

Let us start the argument by considering two closely-related fallacies of probabilistic reasoning. Many people naturally suppose that in a run of coin tosses, if n heads have emerged from all the n coin tosses so far, and no tails have emerged, *and* if the coin is fair — that is, it falls equally often on heads as it does on tails — then one should start betting on tails, because “things will change soon” (Hacking, 2008, p23 et seq.). The same applies to dice rolls.

“[t]his error is called the Gambler's Fallacy... The probability of double-six, relative to the evidence, is still $1/36$.” (Hacking, 1987, p333; cf. Hacking, 2008, p32).

¹⁵⁴ This is particularly true of Leslie's forest shooter analogy, which is taken to be a response to PUT but actually speaks more to MUT.

The supposition made by the gambler, that the previous events will somehow increase the probability of a new arrival of tails or a double-six, is false. If a coin (or die) really is fair, then it will be unbiased, i.e. it will not favour heads over tails (or sixes). Each individual coin toss (roll of dice, or “trial”) will be *independent* of prior trials, and these prior trials will not determine future trials (McGrath, 1988, p265; Hacking, 2008, p30, p33, pp30-31). In other words, just because we’ve only seen a run of heads now (or non-double-six dice rolls), it doesn’t mean that the run “has to” change to tails or double-sixes now; it could be the case that it will change only tomorrow, or next year. This mistake — of thinking that the run of events “has to change soon” — is called the Gambler’s Fallacy (GF). There is, of course, the possibility that the randomiser is biased; that is, the coin is not fair (Hacking, 2008, p31). But if one suspected bias, then it actually would make more sense to bet *with* the run of heads rather than against it. So even if the randomiser is biased, the gambler’s action are irrational.

Hacking contrasts the GF to what he calls the “Inverse Gambler’s Fallacy” (IGF). In the IGF, the gambler bets on how many heads came up in the *past*. Given that we now see a certain event, the IGF argues that there must have been a series of different events in the past.

“[A gambler] enters the room as a roll is about to be made. The kibitzer asks, ‘Is this the first role of the dice, do you think, or have we made many a one earlier tonight? ... slyly, [the gambler] says ‘Can I wait until I see how this roll comes out, before I lay my bet with you on the number of past plays made tonight?’ The kibitzer ... agrees. The roll is a double-six. The gambler foolishly says, ‘Ha, that makes a difference — I think there have been quite a few rolls.’” (Hacking 1987, p333, also in Bostrom, 2002, p17).

The inverse gambler is assuming that since a double-six is rare, that there must have been many rolls in the past. Thus, whilst the fallacious gambler is predicting a *future* dice roll, based on a current *known* run of trials, the inverse gambler is trying to explain an *already-existing fact*, namely the double-six before his eyes, based on an *hypothesised* historical run of trials. Hacking describes the inverse gambler’s reasoning as an attempt at inference to the best explanation (Hacking, 1987, pp334-5), or abduction.

“Thus, a difference between the Gambler’s Fallacy and the Inverse Gambler’s Fallacy is that all relevant prior probabilities are built into the story of the Gambler’s Fallacy.” (Hacking, 1987, pp334).

If the trials are independent, as we assume, then that there’s neither a causal or logically necessary link between a previous run of failures, say, and our seeing a success now, in any truly random system (White and Dowe in Bostrom, 2002, pp18-19, p20). Just as we now see a double-six, it does not mean that there were a lot of dice throws previously that were not

double-sixes. So, the same applies to the universe. Just because we now see a life-capable universe, it does not mean that there must have been a long run of dead universes in the past.

For the sake of clarity, let us summarise these errors in Bayesian terms:

The Gambler's Fallacy (GF):

GF is the position that for T as tails, and H as heads, $P(T|HHHHHH) > P(H|HHHHHH)$. Given a long run of heads, the probability of getting tails on the next toss, is higher than the probability of getting heads. GF is a fallacy because the tosses are independent. The probability of getting heads or tails is always the same: 0.5, on the assumption that the coin is fair.

The Inverse Gambler's Fallacy (IGF):

Where MT is Many Throws, FT is Few Throws, and 6/6 is "I have just thrown two sixes", IGF says that $P(MT | 6/6) > P(FT | 6/6)$. Given that someone has just thrown two sixes, you infer it was more likely than not that these dice had been thrown multiple times. It is a fallacy for the same reason as GF: the throws are independent, hence it is equally likely that a double six would be rolled at any time (0.1667).

Is PUT an instance of the IGF?

If we consider the case of cosmology, we can assume that some suitably large number of runs of a UGD might well raise the chances of a life-hospitable universe arising (just as we will expect rolling 2 dice 1000 times will increase the chance that we get a double six; in fact, we'd expect a double-six 27.77 times). However, we cannot claim that our universe exists *because of* a long series of past lifeless universes (we won't expect that up to 1000 rolls have occurred *just because* we see a double-six). In order to make the latter argument, that there has been a long prior run of dice throws, or universes, further information is required, e.g. that the gambler has in fact been rolling for a long time, or that there have in fact been prior universes. But in the case of the universe, we just don't know that, and indeed, we probably *can't* know; and it is just a mistake to infer it is likely.

One of the analogies in the literature, discussed at some length by Leslie, takes the following form. Suppose a gambler asks his confederates to call him from his nap only if a double-six shows up. They call him a bit later after his nap. The sleeper is perfectly justified in assuming that some rolls of the dice have occurred, since he has been called to witness the double-six. The sleeper knows that he will only be called if this has all occurred. It is quite reasonable for him to assume that the dice have been rolled about 36 times, say, since the odds of 6/6 is $1/36$. The fact that the sleeper has been called demonstrates that the latest result of the roll of the dice is 6/6. The fact that the "latest" roll is a double-six is only the "latest"

because it is the one that happens to have been observed by the gambler entering the room. There was nothing about the dice roll that made it “the latest” until someone observed it. Analogously, it is only the presence of observers that renders this universe particularly amazing — to those observers (Leslie, 1988, p272). That we are conscious and can observe our world suggests that our world is the latest in a run of universes (McGrath, 1988, p265-6; Leslie, 1988, p272), and the length of the run of universes needed to make ours probable, is proportional to how improbable our universe is (cf. White, 2000, pp267). “In my version”, Leslie observes, “a selection effect guarantees that the roll was a double-six. If it had been something else then no gambler would be observing it.” (Leslie, 1988, p272).¹⁵⁵

Leslie’s argument seems to be claiming that many rolls *renders* a serendipitous roll more likely. Yet this seems to be making the same mistake as the “1000 rolls” example. *Whether* there has been a long sequence of universes (or dice rolls) is what we’re trying to figure out; we can’t assume that because we’re here (the gambler observes a double-six after being called from a nap) that we’re seeing the latest in a long series of universes (that there have been many dice rolls) (White, 2000, p267).

“... if we happened to know, on independent grounds, that there are many universes, the fine-tuning facts would give us little reason to question whether the big bang was an accident, and hence our knowledge of the existence of many universes would render the fine-tuning of our universe unsurprising. However, postulate as many other universes as you wish, they do not make it any more likely that ours should be life-permitting or that we should be here. So our good fortune to exist in a life-permitting universe gives us no reason to suppose that there are many universes.” (White, 2000, p273-4).

The implication goes one way only: If there have been multiple rolls, then the gambler is more likely to be woken, because in a case of more rolls, it’s more likely that at some stage, a double-six would have been rolled (White, 2000, p268). However, and this is why the implication goes only one way: If the gambler has been woken, it does not mean that there have been multiple rolls (White, 2000, p268; Whitaker, 1988, pp263-4). After all, the gambler’s confederates could simply have waited an hour, rolled a double-six on the first go by sheer luck, and then woken the gambler up. Indeed, this is exactly Hacking’s IGF, where, upon discovering a serendipitous situation, the gambler assumes that many less fortunate events preceded it.

¹⁵⁵ This argument also seems to be claiming that for a roll to be serendipitous, it has to be *observed*. The latter claim is a form of the Anthropic Principle, which we discussed briefly in the previous chapter.

It looks like Leslie himself, then, is committing the IGF. Hence the “awakening gambler” thought experiment at most shows that things turned out so as to enable our existence (that is, it’s a version of the Anthropic Principle). We can’t tell that a long run of failed universes has preceded us.

“We note that against all odds, the big bang has produced a life-permitting universe—extremely unlikely in one shot, but highly likely after several. So we conclude that there have probably been many big bangs in the past.” (White, 2000, p263).

Suppose, then, that the UGD is a fair device; that is, it has no specific bias for or against life-capable universes. If this were the case, as we see Hacking argue, it would be irrelevant how many universes had existed in the past, as to whether our particular universe were life-hospitable. Each universe, we presume, would have no “memory” of the previous universe,¹⁵⁶ and the chances of any universe being life-capable would be the same, regardless of which point in time it were to arise or eventuate. The only way for PUT to raise the probability of our universe existing, by multiple trials, is if there is a memory effect (White, 2000, p269). Yet even if the universe has a memory effect, we’d then be left with a brute fact that the universe just so happened to always have the right properties to allow the creation of a life-capable universe. Again, repeated iterations of the UGD would not necessarily raise the probability of the universe being life-capable, since the chances or propensities would be fixed. As White tells us,

“Wheeler universes, like dice, have no memories, the individual oscillations are stochastically independent.” (White, 2000, p263).

Therefore, to claim that our life-hospitable universe is a result of a long series of prior lifeless universes is an instance of the IGF (Hacking, 1987, p341, pp335-336; also in White, 2000, p263; Bostrom, 2002, p17).

But what does this mean for the theist/physicalist dispute? It means that if PUT is meant to be a response to creationism, the probabilistic reasoning around PUT is fallacious, and PUT does not in fact raise the probability that a universe would be life-capable. PUT is not an adequate response to the theist.

¹⁵⁶ Hacking, 1987, pp338-9; Holder, 2002, p301; Leslie, 1988, p270; White, 2000, p263

Objections to Hacking's Argument

Let us now consider some of the most prominent objections to Hacking's argument.

1. Are the assumptions of the argument correct?

Hacking assumes, along with many theists and physicalists, that for our universe E, that $P(E)$ is low.¹⁵⁷ In our description of the universe, this is manifest by assuming that whatever the UGD, it has a low propensity to produce life-capable universes. There is nothing really to justify this assumption, other than it accords with the judgment of many philosophers and cosmologists, based on known values of the cosmological constants that enable life on our planet, which we discussed earlier. Indeed, it could be the case that $P(E)$ is very high, in which case the universe would be quite probable; and the appeal to multiple universes or God would be otiose. We made some arguments to this effect in the previous chapter, most saliently Vilenkin's Principle of Mediocrity argument.

More important to consider, though, in assessing the quality of the argument, is the possibility that the individual trials (that is to say universes) are not independent. If, for example, because of some of the memory effect, a life-capable universe is much more likely to be followed by another life-capable universe, then it is reasonable to infer, given the existence of our universe, that it is probable there have been a long sequence of life-capable universes. Refer to the BGV model in the previous chapter as an example of this.

“For all we know the device always outputs precisely those values. If we have no idea whether the cards have been shuffled, or even whether there are any other cards to be possibly selected, then it is unclear whether the sequence generated is improbable.” (Juhl, 2006, p274).

These possibilities must be acknowledged. But they are difficult to justify; and as Juhl suggests, given our ignorance of the relevant matters, it is difficult to make any reliable or interesting probability assessment here.

So here then is how things stand: if we agree that each new universe can be treated as an independent trial, then it does seem to follow that Hacking has shown that the existence of our universe gives us no grounds for thinking such a multiverse (PUT), exists.

¹⁵⁷ I will use capital E henceforth in this chapter as that is what White and Bostrom use.

2. Does IGF apply to MUT as well?

Hacking has thus far argued that IGF applies to PUT only. However, White argues that the IGF also applies to Carter's MUT. If this is correct, then MUT is also an inadequate response to the theist:

“[Carter's hypothesis, MUT] does not entail, nor does it raise the probability of E [our universe]... From the hypothesis that each of the possible configurations of initial conditions and constants is instantiated in some actual universe, it follows that some universe [E'] meets the conditions required for life. It by no means follows that [our universe, E] does. The situation here is parallel to the standard Multiple Universe hypothesis M. Where M raised the probability of E', but not E, [Carter's hypothesis] entails E', but does not entail E.” (White, 2000, p265, my expansions in brackets).

Just because *some* universe (E') will meet the conditions necessary for life, it doesn't follow that *this* universe [E, also referred to in White as α] has to be the one that does (White, 2000, p265).¹⁵⁸ Juhl (2005, pp344-6) makes the same objection. That *some* universe (E') has specific laws and life-favouring initial conditions is just as improbable as any other universe, such as ours (E), having specific life-favouring laws and initial conditions. So there's no reason to privilege our specific universe, E, as an outcome that is miraculous (Juhl, 2005, p346). MUT/PUT raises the probability of there being “some” universe that is life-hospitable, but that it doesn't raise the probability of “our” universe being life-hospitable.

Thus, if Wheeler's PUT model suffers from the IGF, so must Carter's MUT, since the individual universes in the MUT ensemble are also causally isolated, and they also lack a memory,¹⁵⁹ and hence do not affect each other. To infer that there are, or have been, many universes based on our observation of our own universe, is an IGF in both cases. The number of other universes (independent from ours) makes no difference to whether there is life in our universe.¹⁶⁰ The only evidence of any such randomising system is that we live in a life-hospitable universe (Holder, 2002, p304).

Let us return to my egg analogy to get an intuitive feel for why Hacking's argument generalises in this way. If I am blindfolded and pick up, for example, the first egg on a conveyor belt and discover that it's fertilised, I certainly may not claim that there is most

¹⁵⁸ Holder takes White to task about this claim (Holder, 2002, p305). Holder points out that we can't have α , this universe, rigidly designated, if we want to discuss the probability that α exists. Instead, Holder argues, White actually uses and should use “this universe”, $T_1\alpha$, as a designator of any life-hospitable universe (pp305-6).

¹⁵⁹ Hacking, 1987, pp338-9; Holder, 2002, p301; Leslie, 1988, p270; White, 2000, pp263-4

¹⁶⁰ Leslie, 1989, p15; Van Brakel, 1988, p76; White, 2000, p263; cf. Holder, 2002, p295

probably a long conveyor belt of prior unfertilised eggs; the belt may just be empty. Now, let's extend the analogy to the egg cartons: Suppose I'm blindfolded again, and I fumble with the edge of an egg carton and pull one egg out, and, by some means, discern that it's fertilised. There's no good reason for me to suppose without further reason, that there are any other eggs in the carton at all. My only acceptable reasons for assuming that there are other eggs in the carton would be empirical reasons, e.g. the weight of the carton, or that I touched other eggs in the same carton. Hence, the fact that our universe supports life does not support the view (without being guilty of an IGF), that there are any other universes, or that any of them are life-supporting, whether under PUT or MUT. Of course, the reverse is not true. If there do happen to be many eggs in the carton, or on the conveyor belt, then we would expect to eventually find one that is fertilised. So, to repeat, many *actual* eggs raises the probability that one is fertilised, but having *one* fertilised egg *on hand*, does not raise the probability that there are many eggs.

So, MUT suffers from the same problem as PUT, since neither in the conveyor belt case nor the egg carton case do I have solid empirical reasons for assuming there are any other eggs at all. The implication of this thought experiment is that the dimensionality of the universe ensemble is not a very strong factor in judging whether our universe is likely to exist — that is, it doesn't matter if the ensemble is one dimensional (conveyor belt case), two-dimensional (like a single egg carton), or multidimensional (many egg cartons, stacked or otherwise placed). The only real difference the dimensionality makes is to whether there are *now* multiple life-capable universes (MUT), or whether there *will be* or *have been* (PUT).

Of course, one can make an argument that the serialised case entails that a universe with life will eventually come about. But we're trying to work out quite the opposite: whether there is a serialised case (PUT), on the basis that we know one egg is fertilised. And again, the same problem applies to cartons (MUT). Whilst we can say that a very large carton raises the probability that one egg is fertilised (and the larger the carton, the more likely it is), it also lowers the chances that we'll find a fertilised egg. But our having a fertilised egg on hand (our life-capable universe) does not tell us that there's a carton (multiverse) at all. We need independent reasons to suppose that either PUT or MUT is the case. And in this sense, then, Hacking seems to be mistaken in his view that only PUT suffers from the IGF. It seems that both PUT and MUT suffer from it. However, Bostrom disagrees. Let's see why.

3. Bostrom's Objection: simple version

Bostrom disagrees with the view that using MUT/PUT to explain our universe's life hospitality, involves bad reasoning. Bostrom's full argument is long and subtle, but let us begin with a simple observation. Both Hacking and White seem to be committed to the

thought that if there are multiverses, then this would raise the probability of a life supporting universe, E, like ours existing. In Bayesian terms, where M is a type of multiverse (either PUT or MUT):

$$X: \quad P(E|M) > P(E)$$

But as we have argued, it follows trivially from the Bayesian mechanism that:

$$Y: \quad P(M|E) > P(M) \text{ iff } P(E|M) > P(E) \\ \text{[Bostrom, 2002, p23; Reciprocal Support].}$$

Hence if you accept proposition X, as Hacking and White seem to, then you ought to expect that E is evidence in favour of the multiverse. In short, from the Bayesian mechanism, our universe is indeed evidence for a multiverse (and Hacking is wrong).

4. A response to the simple objection: “Some life-hospitable universe” versus “our life-hospitable universe.”

If one considers the foregoing discussion, we have spoken perhaps somewhat loosely about E. In considering the argument for MUT, we ought to distinguish between the claim that given M, the probability of *some* life supporting universe existing (call this E') is high, and the claim that M increases the chance that *our* universe exists (call that E). Bostrom explains White's position as follows:

“While there being many universes increases the probability that there is *a* life-permitting universe, ($P(E'|M) > P(E'|\sim M)$), it is not the case that there being many universes increases the probability that *our* universe is life-permitting. That is, $P(E|M) = P(E|\sim M) = 1/n$ ” (Bostrom, 2002, p19, my emphases).

In other words, the probability of our universe, from (Y) above, is just the same whether M is the case or is not the case, and that probability is $1/n$, where n is the number of universes.

“The probability of [E ...] is just $1/n$, regardless of how many other universes there are, since E's initial conditions and constants are selected randomly from a set of n equally probable alternatives, a selection which is independent of the existence of other universes.” (White, 2000, pp262-3; also in Bostrom, 2002, p20).

But this too, White says, is problematic. We're setting aside E, the *known* universe, as evidence for multiple universes, in favour of E', a weaker piece of evidence, that there is *some* unspecified life-hospitable universe, that supports the likelihood of multiple universes (White, 2000, p264). In other words, we're arguing that, given M, E' is likely, but P(E) is unaffected. This is counter-intuitive (also in Holder, 2002, p301; and Juhl, 2005, p340). Instead, White says:

“What has gone wrong here seems to be a failure to consider the total evidence available [E and E'] to us. If the extent of our knowledge was just E' [some life-supporting universe], then this would count as evidence for M, since $P(M|E') > P(M)$. But we also know E [our universe], and must not leave that out of our calculation of the probability of M. What matters is the probability of M given E' and E. But now since E entails E', [it follows that] (E' & E) is equivalent to E. So $P(M|E' \& E) = P(M|E)$.” (White, 2000, p264, my inserts).

Our universe being life-permitting is just a function of our universe being a member of the set of “some” life-hospitable universes; that is, E (our universe) entails E', that some life-hospitable universe exists. But our life-hospitable universe E does not raise the probability that MUT (M) is true, i.e. $P(M|E) = P(M)$, because to claim otherwise would be the Inverse Gambler's Fallacy (that what we see now is evidence of a prior series of trials).

“Hence $P(M|E' \& E) = P(M)$. So while the Multiple Universe hypothesis may be confirmed by E' alone, it is not confirmed by E' in conjunction with the more specific fact E, which we also know. It does not matter in which order we calculate the relevance of E and E', our confidence in M on our total evidence should remain the same as it is without considering E or E'.” (White, 2000, p264).

To illustrate the plausibility of this claim, White explains, that a gambler is justified in assuming that if he's been told that a double-six was rolled (E') at some stage, that many rolls might well have occurred, as Leslie tells us. But if the gambler witnesses the results of a particular roll of double-six (E), e.g. after being woken, he may not make any such assumption. That is, E' is evidence for M, but, E is not evidence for M. Based on purely our own evidence E, we cannot assume that there have been many other universes M. No quantity of other big bangs will be implied by our particular universe, in the same way that

no number of rolls of dice are implied by a double-six having been rolled (White, 2000, pp264-5). And as we've observed, this seems paradoxical, so how do we respond to it?

5. Bostrom's Objection: sophisticated version

We can undermine the simple argument from reciprocal support (Y, above) by paying careful attention to how we characterise our evidence. While it is true that: $P(E'|H) > P(E')$ and so the evidence that there is *some* life-hospitable universe would confirm the multiverse, it is not true that $P(E|H) > P(E)$; that is *our* life-hospitable universe does *not* confirm the multiverse. To think so is to commit the IGF. The evidence we have on hand is E and not just E', so there is no support for the multiverse theory from the evidence.

Bostrom's full argument (2002, p20 et seq.) against White, however, does not just rely on what we called above the relation of reciprocal support. So, before endorsing White's conclusion, we ought to consider Bostrom's argument in more detail. On its face, it is considerably more sophisticated than the above argument, but we shall see it crucially turns on similar issue to the one discussed above. As we have said, White and Hacking are committed to the following:¹⁶¹

$$P(M|E') > P(M)$$

$$P(M|E) = P(M)$$

Bostrom's argument (2002, p19 et seq.), is meant to show there is something counterintuitive about holding to both of the above. He begins by supposing that there exist $\alpha, \beta_1, \dots, \beta_{m-1}$ which are all the actually existing universes (α being our universe). He then takes 'E_i' (where $i = \alpha, \beta_1, \dots, \beta_{m-1}$) to represent the proposition that if some universe is life-permitting, any specific one, i , is life-permitting. Given the above, it follows by definition that $P(M|E' \& E_\alpha) = P(M|E)$. Since $P(M|E') > P(M)$, and since $P(M) = P(M|E)$, from that, in turn, it follows that:

$$(*) P(M|E' \& E_\alpha) < P(M|E')$$

If we now turn to consider the same probability relation for the other universes, then Bostrom claims (p20), we should say that:

¹⁶¹ The difference between White and Hacking, of course, just being that White thinks that $M = \text{PUT and MUT}$, whereas Hacking thinks that $M = \text{PUT}$.

“ $P(M|E' \ \& \ \beta_j) = c$ [a constant], for every β_j , for no ground has been given for why *some* of the universes β_j would have given more reason, had it been the fine-tuned one, for believing M , than would any other β_j similarly fine-tuned...

[And since E' is equivalent to] $E'E_\alpha \vee E'E_{\beta_1} \vee E'E_{\beta_2} \vee \dots \vee E'E_{\beta_{m-1}}$, this together with (*) implies:

$P(M|E'E_{\beta_j}) > P(M|E')$ for every β_j

In other words, White is committed to the view that, given that some universe is life permitting, then: conditionalising on α [our universe] being life-permitting *decreases* the probability of M , while conditionalising on any of the $\beta_1, \dots, \beta_{m-1}$, *increases* the probability of M .

But that seems wrong. Given that some universe is life-permitting, why should the fact that it is *this* universe that is life permitting, rather than any of the others, lower the probability that there are many universes? If it had been some other universe instead of this one that had been life-permitting, why should that have made the multiverse hypothesis any more likely? Clearly, such discrimination could be justified only if there were something special that we knew about *this* universe that would make the fact that it is this universe rather than some other that is life permitting significant. I can't see what sort of knowledge that would be.” (2002, pp20-21, my inserts/edits).

I have quoted extensively from Bostrom so as to be sure to lay out all the elements of the arguments as fairly as possible and avoid misinterpretation. The first thing we ought to note is that despite all the technical sophistication, the argument ultimately turns on an intuition. We do not here have an argument like the one we sketched against Swinburne (or at least one possible interpretation of Swinburne) in Chapter 7 where, developing some remarks by Gwiazda, we could show that a commitment to the idea that simplicity implies high probability, leads to probabilistic incoherence. Bostrom is not claiming that the probabilities of White's argument commit him to incoherence. Rather, Bostrom merely thinks there is something odd about the way, as he puts it, we are discriminating against different forms of evidence (E versus E'). An adequate response to Bostrom, then, simply has to show that such discrimination is justified.

Such an argument is easy to mount. *Our universe is special, precisely because it is our universe and so we know it exists.* We know nothing about any other universe. If we did,

that is, if we came to know β_1 , then obviously that would affect rather dramatically whether we thought there were other universes.

Consider again the simple case of the gambler who sees the kibitzer roll a double six. As we have argued *ad nauseam*, it is a mistake for the gambler to infer on that basis that there have been many rolls. But now suppose someone in the room says, “That’s the second one we have seen tonight.” The gambler knows then that there have been at least two rolls. Should she infer that probably there have been more than two rolls? Pretty obviously, yes, since it is much more likely in that case, that another double six would have been rolled. Bostrom’s case is similar. The β -universes increase the probability of M, because they provide crucial new information — information in this case that there is in fact at least one other world. And that information increases the chance that there are many other worlds.

The way Bostrom describes the situation can create the impression there is something fishy about the asymmetry in the evidence that White is committed to, since Bostrom describes all the universes as created equal. But of course, that does not describe our epistemic situation. We know, and in fact all we know, is that our supposedly improbable universe, α , exists. We know nothing about β -universes at all, including whether any of them exist.

“The flaw lies in the bookie’s [Bostrom’s] premise that the gambler doesn’t have any information available to him that justifies his discriminatory treatment” (Boyce, 2012, pp7-8).

Bostrom’s more sophisticated argument then amounts to no more than the expression that there is something odd about treating evidence derived from this world differently from evidence from another world, which White recognises. A little reflection on our epistemic situation shows why this is not odd at all, and in fact required. We know of one improbable world — ours — and it tells us nothing about other worlds. But learning of other improbable worlds — β -universes — would of course affect our judgment about the probability of a multiverse; did we know of any such universes, we would significantly increase the posterior probability that M.

However, this discussion may not be germane to the most important motivations for MUT/PUT. It seems that cosmologists base their notion of MUT/PUT *not* on the evidence that this universe exists *per se*, but rather on other evidence that we see within our universe which points to the existence of other universes; specifically, quantum history trajectories, and evidence of inter-universe collisions, of pocketing or island formation, in the Cosmic Microwave Background Radiation, all of which were discussed in the previous chapter and

all of which remain the subject of much controversy.¹⁶² MUT/PUT is thus motivated by specific scientific concerns and is not just an *ad hoc* response to the theist.

Two further points are worth making about MUT/PUT in the context of assessing whether the cosmological argument can support theism. Firstly, MUT/PUT is not the only response to the fine-tuning argument that the physicalist might offer. As we noted in Chapter 9, there are those who argue our universe is not improbable, and those who take a skeptical position towards fine-tuning arguments. The former can argue that our probability assessment is just incorrect (e.g. Vilenkin). The latter argue that given our incomplete knowledge of fundamental physics, we are in no position to know whether it is improbable a universe like ours exists; maybe the fundamental laws just do allow only one value for all the physical constants (e.g. Juhl and Stenger). In assessing $P(e|\sim h)$ (the probability that this universe exists given the God of restricted theism does not exist) and $P(e|h_m)$ (the probability that this universe exists given physicalism is true) all of these possibilities would need to be taken into account. There seems no grounds, given our earlier discussions, for thinking that $P(e|h)$ is higher than either of these values — $P(e|\sim h)$ or $P(e|h_m)$.

But the second point worth making is that none of these physicalists' responses answers the theist's question of *why anything exists at all*, and that it seems is not a problem well-understood in terms of probability theory. It's a much more basic problem. But then again much the same can be said of the theist, like Swinburne, who postulates a contingent God to explain the universe. Why should *God* exist rather than nothing?

Conclusion

Granting certain presuppositions, most importantly, that the probability of any one universe is independent of every other in MUT/PUT models, we have argued that White is correct: any attempt to argue that the existence of our universe (E or α) provides evidence for a multiverse, is fallacious.

Nevertheless when we come to consider the merits of Swinburne's cosmological argument or indeed any Bayesian argument for the existence of God, this ought not to be much comfort to the theist. For we have argued that given there is no non-arbitrary way to fix the prior, $P(h)$, there is no way to formulate a coherent P-inductive argument.

In the last few chapters we have also effectively argued that there can be no cogent C-inductive argument. CITI tell us that in order for e to confirm h , it must be the case that $P(e|h) > P(e|\sim h)$. How did we conclude this? We started by following Swinburne in thinking that likelihood is a measure of explanatoriness. We rehearsed four arguments from Swinburne to

¹⁶² See Feeney, et al., (2011), also in Stenger, 2011, p229, and Vilenkin, 2006, pp90-1.

show why he thinks $P(e|h)$ is high, namely, that *God would create*, that he'd create *a universe*, that he'd create a universe *like ours*, and that he'd create *beings like us*. However, we offered objections to his four arguments, most saliently the No-Creation series of arguments, which claimed that God wouldn't create anyway, for various reasons, as well as the Divine Indeterminacy argument, which argues that God wouldn't be able to choose from all the options, and so, in both cases, we have grounds for thinking $P(e|h)$ would be very small. Hence, we can't claim that $P(e|h) > P(e|\sim h)$.

Of course, if it can be argued that $P(e|\sim h)$ is even smaller than $P(e|h)$, if $P(e|h)$ is small, then Swinburne would have grounds for claiming he has a successful C-inductive argument. But we have not found any grounds for supporting that idea. Even if MUT or PUT by themselves are not supported by the existence of our universe, there are many other cosmologies open to physicalists, and those who, for other reasons, would reject restricted theism. Some of these give the physicalist reason to think $P(e)$ is high, such as Vilenkin's argument. Taking all of those possibilities into account, there seems no reason to think $P(e|h) > P(e|\sim h)$, especially given the vague and qualitative assessment we have been able to give of the likelihoods.

The cosmological argument is therefore a failure, because, as we saw in Chapter 7, we cannot obtain a P-inductive argument (due to being unable to fix the priors), and now we see that we can't get a C-inductive argument.

In the final chapter, then, we shall see if we can draw an even stronger conclusion that there are positive reasons to think not just that there is no good argument for theism, but that there might be a conclusive argument against theism. We shall consider the traditional argument from evil in a Bayesian context, and show that some of the special features of this argument can avoid some of the difficulties we raised for P-inductive and C-inductive arguments from cosmology.

11. Gratuitous Evil, Theodicy, and Skeptical Theism

“There seems to me too much misery in the world. I cannot persuade myself that a beneficent and omnipotent God would have designedly created the ichneumonidae with the express intention of their feeding within the living bodies of caterpillars, or that a cat should play with mice.” — Charles Darwin¹⁶³

Introduction: Why would God create a universe with evil?

So far, we have argued that since there is no principled way to fix the priors in Swinburne’s cosmological argument, it is impossible to use it (in part or whole) as a probabilistic P-inductive argument for theism. In the last few chapters, we have considered whether, setting the problem of the priors aside, there might nevertheless be a good C-inductive cosmological argument. In other words, we considered whether there were good grounds for claiming that, where e is the evidence of our universe, and h is theism, whether $P(e|h) > P(e|\sim h)$. After extensively examining the arguments of Swinburne and some modern cosmologists, we found no evidence which clearly supports theism over any alternative (or vice versa). In this final section, we turn to a familiar argument, the argument from evil, as a way of providing an argument against theism. As we shall see, a plausible case can be made that the argument from evil is by itself a good P-inductive argument, and for reasons that we shall discuss later, it can be introduced in way that circumvents the problem of the priors. Then, in the final two-thirds of this chapter we will discuss some theistic responses to the problem.

Thus far, we’ve seen that we believe that theism could provide a strong P-inductive argument only if the theist could convincingly argue that a world like this one would be just the sort of world that a good God would create. Yet we can argue that this is not the sort of universe that a good God would create, quite the opposite. Hence, in this chapter, we will discuss why God would allow evil, and we deal in particular with the argument from Gratuitous Evil; that is, that there exist some evils that are so evil, that God ought to never allow them.¹⁶⁴ If this argument goes through, it means that $P(e|h)$ is very low, and again, the cosmological argument fails.

When confronted with the argument from Gratuitous Evil, some theists resort to a skeptical argument; that is, that we can’t know God’s mind or plans. I will therefore raise two complaints in this chapter. The first is that such skepticism is inconsistent with theodicy. Either theists should claim to know why God made the universe (*and* at least one theodicy is

¹⁶³ Letter to Asa Gray, 22 May 1860, in Huberman, 2007, p82

¹⁶⁴ In this chapter we will mostly follow Plantinga’s symbol usage and use G for the hypothesis of theism, and Rowe’s usage, with $E1$ and $E2$ being evidence of evil. GE will be the hypothesis that Gratuitous Evils exist.

true), or, they know neither.¹⁶⁵ The second complaint that we'll raise will be that theodicies are uniformly offensive and inconsistent, and should not be entertained by people who take morality seriously.

The Argument from Gratuitous Evil

The argument from gratuitous evil is offered by William Rowe (and Draper, in Peterson, Hasker, Reichenbach, Basinger, 1996, p230). Whilst we can understand that some evils serve a purpose — e.g. experiencing pain when you touch a stove — not all evils, it seems, have such an ultimately good purpose; and these we consider “gratuitous”.

There are two types of evil normally cited in the literature; evils caused by intentional agents (such as criminals), and evils caused by nature (such as fires). Rowe regularly uses the same two examples of each type; what he calls E1 and E2. E1 is a toddler being raped and killed; E2 is a fawn dying in a natural forest fire slowly over several days (Rowe, 1991, p72; 1998, p545).

Gratuitous evils (GE) are those evils, then, that serve no higher purpose, and so, God should not allow them. In probabilistic terms, $P(GE|G) = 0$. GEs are defined differently by different authors.¹⁶⁶ These various definitions are, however, generally unclear or problematic. So we will use the definition that follows, which is distilled from the others:

GE: A gratuitous evil *GE* is an evil which is not sufficient, or necessary (in any modality)¹⁶⁷ as a cause of any future greater outweighing good *g* (i.e. *GE* never can produce *g*), and the absence of *GE* would not prevent either the realisation of *g*, or prevent greater evils than *GE*.

In short, and loosely speaking, a GE is a pointless or unjustifiable evil. Many authors assume, and write, from the perspective of horrific evils.¹⁶⁸ The argument from horrific evil is not same as the argument from GE, though they are often confused, because GEs cited often are horrific examples, to make the point clear. The argument from GE, rather, is *just* that if the evil suffered will never, ever bring any benefit, or enable a future greater good, or prevent any worse evil, it is gratuitous. So, for example, one can well believe, for example, that a murder is a GE, since the victim gains no benefit. Yet on the other hand, one might argue that, in the case of assassinating Leopold II of Belgium, for example, we are preventing a greater evil (the massacre of millions of Congolese). So, it is unclear — even in the case of

¹⁶⁵ Importantly, I must emphasise that the purpose of this chapter is to show a broad weakness in all theodicies, rather than attacking them individually (as there are many) (Simpson, 2009a, p154).

¹⁶⁶ Rowe, 1991, p80; 1998, p272; Rhoda, 2010, p2; O’Leary-Hawthorne and Howard-Snyder, 1993, p861; Rowe in Howard-Snyder et al., 1999, p116; Rhoda, 2010, p10, pp12-13; cf. Howard-Snyder et al., 1999, p117, all give slightly different definitions.

¹⁶⁷ Logically, ontologically, causally.

¹⁶⁸ See, e.g. Bishop, 2007a, p393.

murder — whether there are such things as GEs. Let's see, then, whether we can make the case that there are such things as GEs, and develop that into an argument for atheism.¹⁶⁹

Rowe, who introduced the argument from GE, originally tried to cast the argument as a syllogism, shown below. His argument is that, by definition, if an evil has a purpose, it is not a GE (Rowe, 1991, p80), and, since theists claim that all evils must serve God's purposes, there should be no GEs at all if theism is true; otherwise, God would be capable of evil (Rowe, 1991, p81; Rowe, 1998b, pp547-8). Now, since God does not prevent evils that are apparently GEs, they must serve his purposes (Van Inwagen in Howard-Snyder et al., 1999, p128). Therefore, Rowe originally argued, either GEs exist or God (G) does (cf. O'Leary-Hawthorne et al., 1993, p867). Rowe's original argument is as follows:

- (1) There are instances of intense suffering which God could prevent, without thereby losing a greater good.
- (2) God *would* prevent intense suffering unless he could not do so without permitting a greater evil or preventing a greater good.
- (3) Therefore there is no God (Rowe, 1979, p336; cf. Rowe, 1991, pp72-3).

A theist should accept premise (2) — namely, what Plantinga calls the ability to “properly eliminate” evil (Plantinga in Peterson et al., 1996, p261). Therefore, a theist must deny (1) (Rowe, 1979, p338) if he wishes to deny (3), since (1) and (2) jointly entail (3) (Rowe, 1979, p337). So what is the argument for (1)? Well, God could have prevented E2, and it served no greater good. This gives support to premise (1). Rowe accepts that there might be some greater good that we cannot see, and that the fawn's death is inextricably linked with that greater good. But it seems unlikely, Rowe continues, that *all* instances of terrible suffering are linked to some greater good, and that *all* of them were required by God in order to enable a greater good.

But now it is apparent that we have moved from categorical to probabilistic judgments, and so, the argument must be recast as an inductive one. A particularly clear presentation of this version of the argument is given by Draper, which has some nice features worth highlighting, and which we will use in preference to Rowe's version. Take J to be any statement justifying why an evil exists (which can also be read $\sim\text{GE} = \text{an evil is justified}$):

- i. $P(J|E1 \& k) < 0.5$ [It is unlikely that E1 is justified, i.e. E1 is probably a GE]
- ii. $G \& E1 \supset J$ [If God exists, any evil is in fact justified]
- iii. $P(G \& E1 | E1 \& k) < 0.5$ [From i and ii, and: $(A \supset B) \text{ then } P(A|C) < P(B|C)$
That is, we substitute J in (i) to the G&E1 in (ii)]

¹⁶⁹ We will only later address the second argument, that is, whether that even if there are no GEs, entertaining a theodicy is just so morally obnoxious, that we should not even do so.

- iv. $P(G|E1 \& k) < 0.5$ [From iii and: $P(A \& B|C) = P(A|C) \times P(B|A \& C)$;
 $A \supset B$, then $P(B|A) = 1$].¹⁷⁰

As we can see, this is a P-inductive argument, since $P(G|E1 \& k) < 0.5$ (a strong conclusion). We have arrived at the conclusion that it is objectively unlikely that God exists. The reason we can do so here, and circumvent the problem of the priors, is because of premise (ii). Theists and atheists alike must accept that if God exists, there ought to be no GEs. Hence, if we can argue that it is probable that there are GEs (Premise (i)) then it follows, objectively, that it is probable God does not exist. Of course, the question is whether Premise (i) is acceptable to the theist — that is, whether E1, say, is a GE.

Plantinga's response and Evidential Relevance

Plantinga characterises Rowe's position as follows:

“*p*: it is false that there is a known good [*g*] and a perfect being [*G*] such that the former [*g*] justifies the latter [*G*] in permitting E1 and E2.”¹⁷¹ (Plantinga, 1998, p532, my inserts).¹⁷¹

This is a verbose rendering of the gist of (Draper's) premise (i) in our formulation above; that is, $P(J|E1 \& k) < 0.5$. Plantinga also accepts that the argument leads to the conclusion that, as he put it, “*p* rather substantially lowers the initial probability of *G*, and in that sense, disconfirms it”. In fact, as we have seen in Draper's formulation, the argument is stronger. It provides objective reasons to think it is more probable than not God does not exist.

Plantinga starts his counter-argument that there exists an alternative to *p*, namely *p**, which would render God more probable. Consider Plantinga's alternative proposition:

“*p**: Neither E1 nor E2 is such that we know that no known good justifies a perfect being in permitting it.” (Plantinga, 1998, p536).

Fixing what he takes to be reasonable values for this proposition, the outcome of this *p**, is an argument which makes theism more probable.¹⁷² He says, (p538) “So far, then, it looks as if Rowe's atheistic argument from *p* is counterbalanced by the theistic argument from *p**.”

Yet some of the oddness of Plantinga's argument comes from including the uncertainty as part of the proposition: the phrase “Neither E1 nor E2 is such that we know”. This is most naturally rendered in a Bayesian framework as a less-than 1.0 credence to an alternative

¹⁷⁰ Draper, 1992, p307. Draper uses different symbols to those given here; I've used my own symbols for consistency.

¹⁷¹ I use lowercase *p* and *p** here to avoid confusion with *P* (“It is probable that”), although Plantinga himself uses *P*.

¹⁷² The reader can see the details of Plantinga's argument on 1998, p536 et seq.

proposition or sentence. Put another way, this would normally be stated as, “there is likely a justification for E1 and E2”.

We can see, in effect, that this “alternative” argument amounts to no more than a covert denial of (i). So Plantinga’s conclusion is no more surprising than the claim with different premises you might reach a different conclusion. The important point is whether (i) is plausible — more plausible than Plantinga’s alternative probability judgment. This is part of what we will discuss later: whether there is any case of an evil lacking a justification.

Plantinga then goes on to criticise Rowe for using “degenerate evidence”. Plantinga presents us with what he calls *the barefoot argument*. In effect, Plantinga rehearses Rowe’s (1998) argument and supplies a different value for E1 and E2, namely, *being barefoot*; and argues that, as a *reductio ad absurdum*, that you can obtain the same result, that God does not likely exist (p538 et seq.). Therefore, Plantinga believes, Rowe’s argument fails.

It should furthermore be noted that our preferred form of the argument, as given by Draper rather than Rowe, does not allow the nice symmetry Plantinga expects between his different formulations. If we render (i*) $P(J|E1 \& k) > 0.5$, which would play an equivalent role to Plantinga’s p^* probability judgment, there is no valid argument which will take us from there to $P(G|E \& k) > 0.5$. We also can’t run an equivalent argument by trying to replace (ii) with $[\sim G \& E1 \supset \sim J]$, as this is clearly not a valid inference. It does not follow from the fact that God does not exist that there is no justification for E1. So it seems that Plantinga’s argument represents a misunderstanding of probabilistic reasoning.

On the matter of the *barefoot argument*, then, we take the evidence E1 to be relevant to the debate between the theist and atheist because the relative likelihoods are different. Evidence E1 seems more probable given that God does not exist ($\sim G$) than if God existed (G). That is, we think that if E1 exists (which it surely has in the past), and, if God really is omnibenevolent and would not allow such a vile evil, $P(E1|G) \ll P(E1|\sim G)$. Hence this evidence, E1, as Bayesian reasoning shows in (i)-(iv) above, will increase the probability that God does not exist. Generally speaking, for evidence e to be relevant to a hypothesis h , the likelihood of the hypothesis has to differ from the prior. That is,

$P(h|e) > P(h)$: e confirms h , and e is evidentially relevant to h .

$P(h|e) < P(h)$: e disconfirms h (Popper’s *falsification*), and e is evidentially relevant to h .

$P(h|e) = P(h)$: e is not evidentially relevant to h .

Being barefoot, however, simply is not evidentially relevant (Rowe, 1998b, p550), because $P(\text{barefoot}|G) = P(\text{barefoot}|\sim G)$. From these considerations, it seems that the argument from GE is in fact a strong argument against theism. Let’s now consider some other responses to GE.

Theists' responses to the argument from GE

Theists must deny that there are in fact GEs, or that it is even probable that there are GEs, since it seems that GEs are indeed incompatible with theism. Theists have essentially two strategies. First, they can try to justify apparent GEs. The most systematic way this done is through theodicies. Alternatively, they can try to cast doubt on our ability to judge whether there truly are any GEs, given our finite minds and finite ability to comprehend the possible goods that might emerge from apparent GEs. This is the attitude of so-called Skeptical Theism. We consider both strategies below.

Theodicies

Theodicies are arguments which claim to show why God allows evil. The existence of certain evils, theodicies tell us, make goods of greater value possible (Peterson in Hasker, 1992, p99). God would therefore only prevent evil if he had no morally sufficient reason to permit it (Pike in Draper, 1992, pp303-4). Since evil exists, all evils that exist are part of God's plan, which explains the evils. Theodicies, then, are attempts to articulate in part at least elements of God's plan, which explain or explain away evils. Thus, theodicy is the attempt to argue that Draper's (i) above is false, in other words:

i.' $P(J|E1 \& k \& G) > 0.5$ [Evil is probably justified, given E1 and G]

From which we are no longer justified in claiming that God's existence is less than 0.5 probable given E1 or indeed that such facts make God's existence less probable.

Free-will Theodicy

The most commonly-cited theodicy is the *free-will theodicy*. This argument claims that evil exists because people have free-will, and that God could not inhibit our choosing evil without reducing our free-will (Van Inwagen, 1988, pp161-187). The key point about the free-will theodicy is that it offers us good grounds for supposing that God would allow evil, namely, that we would not have free-will if God kept on intervening in our choices. Whilst E1, for example, seems particularly terrible, some theists argue that E1 is an instance of human free-will, and therefore supports the ends of God by allowing a criminal to have and learn the consequences of free-will, which is a great good.

Now, Plantinga distinguishes between a *defence* and a *theodicy*, because he recognises that theodicies have some difficulties (which we will see throughout the remainder of this chapter).¹⁷³

“Quite distinct from a Free Will Theodicy is what I shall call a Free Will Defence. Here the aim is not to say what God’s reason is, but at most what God’s reason might possibly be.” (Plantinga, 1977, p28).

A defence merely aims to show that the atheistic conclusion does not follow; that evil does not entail God’s non-existence, and that if libertarianism could be true, then evils could be explained by free-will. As long as some evils can be explained with human free-will, we might assume, that with some contemplation, all evils can be explained, as necessary parts of God’s good plan for a generally good world order. A theodicy, unlike a defence, makes a stronger claim. A theodicy claims to *know* why God allows evil (cf. Simpson, 2009a, p154). That, is a *theodicy* tries to show that evil is in fact compatible with God’s existence.

Objections to Free-will Theodicy

The trouble with free-will theodicy is that it requires libertarianism, which in itself has many philosophical problems.¹⁷⁴ We raise this point because the free-will theodicy seems to require acceptance of the premise that God’s intervention in our actions would be incompatible with our having free-will. Yet, as Walls (1991) argues, a free-will theodicy cannot succeed if we assume that *compatibilism* is true.¹⁷⁵ For, Walls argues, if compatibilism is true, God *could*

¹⁷³ We explain the difference between a defence and a theodicy for completeness’ sake here as it is a famous distinction that Plantinga first drew.

¹⁷⁴ Theists tend to be libertarians, as a survey of the literature will tell you. This is the position that free-will is incompatible with determinism (incompatibilism), *and* that determinism is not the case. See for example Van Inwagen in Stump et al., p196 et seq.; also Van Inwagen, 1988; Van Inwagen, 1999, pp404-405; 2000, p10; Van Inwagen in Wainwright, 2005, p200; and in Hill, 2007, p3; Plantinga in Lewis, 1993, p6; Swinburne, 2004, p36, p42, pp169-70, Plantinga in Hasker, 2001, p104. Swinburne (2004, p36, p42) in particular assumes that “basic acts” are how free-will operates, and “basic acts” are one of the fundamental concepts of libertarianism. See also Vargas in Timpe, K., and Speak, D (Eds.) (2016), p2:

“my guess is that ... a disproportionate number — perhaps even most — libertarians [in the philosophical community] are religious, and, specifically, Christian. ... a strong belief in a particular divine moral order ... requires a strong notion of human freedom.”

Timpe et al. also talk about “motivated reasoning”, where theists argue for libertarianism in order to preserve “deserved damnation” (p13), and that some, like Van Inwagen, consider the possibility of our not having free-will “simply not an option”, regardless of the evidence that libertarianism might be false, because the conclusion is so undesirable: viz., that hard determinism would remove the possibility of the free-will theodicy, damnation, etc (p14). It is unclear that theists need libertarianism. Compatibilism might well do. Under compatibilism, a person S can still be free and meaningfully choose to perform action A, in order to accomplish a goal X, *because of* prior reasons and circumstances. So long as S accomplishes X because S wanted X and performed A, S is free. This could be sufficient for God. We discuss these matters briefly in Chapter 11 under ‘Theodicy’.

¹⁷⁵ That free-will is compatible with determinism. See, e.g. Frankfurt, 1969, Leon (1999, 2001, 2002).

intervene in evil without compromising our free-will. If so, then theodicy would fail; evil could be intervened with, without inhibiting free-will. Another, stronger, response could be brought to bear from Pereboom's *hard incompatibilism* (cf. Pereboom, 2001) or hard determinism (Pereboom, 2012). Pereboom argues that we do not in fact have free-will. If we do not have free-will, we could not use free-will as an explanation for evil.¹⁷⁶

Secondly, E2, the natural evil in which a fawn dies in a forest fire, does not seem related to our having free-will (even if E2 might be covered by other theodicies which can explain it). A fawn presumably does not have free-will, and does not learn from its suffering that it should not choose to do evil or sinful things as a result of choosing incorrectly and freely; it merely suffers the fire. So, free-will theodicy at least does not deal with E2; at least not unless we take seriously the possibility that natural evils have to do with free choices of supernatural agents, such as demons, who may cause the natural evils, and which said supernatural agents are not inhibited by God, for the same reason that God does not inhibit free humans; so that they can exercise free choice and thereby earn Heaven or Hell.

As the details of this argument are nuanced, varied and complex, I leave this discussion aside for another work. The point to be made is just that free-will theodicy, alone, is not as convincing as a theist may hope, nor might it work unless libertarianism is true. Let us now turn to some other theodicies to see if we can bolster the theist's case against GE.

Soul-making theodicy, and evil as a means to greater good

Some theodicies argue that evil improves us morally, and causes us to be courageous. Others argue that our souls are improved, and thus we earn heaven. And yet others argue that we learn from evils, and thereby survive better; that is, that evils facilitate our evolution or survival. Because evils enable higher-order goods, evils are of a lower or more trivial order than the goods that they cause. What all of these arguments have in common, is that evil is described as being necessary for a greater future good. Let's see how these various arguments work.

The argument for Soul-Making Theodicy (SMT) is the claim that evil helps us earn our place in heaven. So, God allows some evils to exist in order to develop us morally¹⁷⁷ or for us to achieve atonement with God ('redemptive suffering').¹⁷⁸ Suffering, then, makes one's triumph over evil even greater. Souls that have suffered and still chosen the good, are more valuable than souls that have not struggled to be good.¹⁷⁹ It is best, all things considered, that God allows evils, so that we can suffer through them and achieve the end, or

¹⁷⁶ Interestingly, in 2012 and 2013, Pereboom argues that it is nonetheless possible that God would still be God, and still be omnibenevolent. He provides a theodicy predicated on theological determinism.

¹⁷⁷ Rhoda, 2010, p17; Betenson, 2015, p88; Pereboom, 2012, pp275-6

¹⁷⁸ Mackie, 1982, p158; Stenger, 2009, pp140-141

¹⁷⁹ Hicks in Hasker, 1992, p100; Mackie, 1955, p206; Swinburne 2004, p114; Mackie, 1982, p153; Rowe, 1979, p338

consequence, of deserving heaven.¹⁸⁰ Some moral goods, then, are more valuable because they were achieved by means of a struggle (McCloskey, 1960, p102, 106-7).

It is therefore apparent that some evils can give rise to moral virtues. Suffering, for example, gives rise to courage, benevolence, endurance, patience, and charity, which are of a higher spiritual order than mere pleasures, or mere absence of suffering.¹⁸¹ Evil also impels men to improve things (McCloskey, 1960, p106). So, not only do we polish our souls to be worthy of heaven, through suffering evil, but we also gain other benefits, such as incentive to improve the state of this world, e.g. through medicine, charity for the poor, etc.

Another future benefit that we might gain as a result of the existence of evil, is *learning*; specifically, learning to cope with evil and hardship. If we knew the purposes of all evils, we wouldn't be motivated to combat them (since we'd know they were necessary evils), and this would defeat their point of us resisting them. Thus, God has to refrain from letting us know what the point of evil is, so that we combat it, and learn from it.¹⁸² Evil thus offers us an opportunity for heroism, and to learn about evil, and combat it. It is up to us whether *we* do something about any particular evil. It is for the good or benefit of us having the power to make a difference to evils, that God permits them. "That good would not have occurred if those evils had been prevented." (Howard-Snyder et al., 1999, p116; Swinburne, 1977, pp81-102).

We can also consider this from the point of view of "orders" of evils and goods. So, the argument may go, pain and misery are first-order evils, and pleasure and happiness are first-order goods (Mackie, 1955, p206). These first-order goods and evils result in second-order goods and evils. Examples of second-order goods are compassion, heroism, mercy, and so on; examples of second-order evils are malice, cowardice, cruelty, and so on. Second-order goods logically require first-order evils; for example, without misery, there could be no compassion (Mackie, 1955, p206). First-order goods and first-order evils are both outweighed by second-order goods and evils. First-order evils thus enable the second-order goods (Mackie, 1955, p207). The second-order goods, then, in a sense, "absorb" the lesser first-order evils (Mackie, 1982, p154).

We can think of many examples of this. A typical example of a first-order evil is pain. But pain is also a deterrent to prevent worse things like death; since, if it weren't for pain, we might place ourselves in deadly danger. But torture, as a second-order evil, is possible because we have the evolutionarily necessary capacity for pain (Mackie, 1982, p152). Thus, if God permits suffering, it is because it achieves an even greater good such as our ability to avoid danger (Mackie, 1982, p153; Swinburne, 2004, p116).

Suppose, then, that Rowe's E2, the case which we saw was not answerable by the Free-Will Theodicy, is a side-effect of a world in which combustion (oxidation) is possible. God could not make a world with cellular respiration without oxidation being possible.

¹⁸⁰ Betenson, 2015, p88; p89; Wilks, 2004, p313; Simpson, 2009a, p164, p168

¹⁸¹ McCloskey, 1960, p102, pp106-7; Simpson, 2009a, p157; Peterson et al., 1996, p248

¹⁸² Howard-Snyder & Howard-Snyder, 1999, p126, p121; Hasker in Rowe, 1991, p85.

Hence, fire is possible. Furthermore, creatures survive better if they strenuously try to avoid fire. Hence, to cause creatures to avoid fire and understand that it is harmful, animals must be able to feel pain when exposed to fire. This is an evolutionary advantage; creatures that did not experience pain when exposed to fire, would not avoid fire and would become extinct. Thus, due to the necessity of oxidation for cellular respiration, and harm-avoidance for evolution, E2 is possible in a world which God might well design. E2 is not, contrary to Rowe's claim, a GE. Combined, then, with Free-Will Theodicy and SMT, as well as an evolutionary explanation for natural evils, it seems that the theist can answer the problem of evil.

Objections to SMT

Objection 1: Orders of Goods

Let's start by considering the various 'orders' of goods and evils. Might it not seem more plausible that God should have preferred it if we'd not performed evil in the first place? (Mackie, 1982, p159, Rhoda, 2010, p21). Why should God need first-order evils to create second-order goods? Even if evils provide us with an opportunity to be heroic and right the wrongs, it's a bit like an arsonist setting a fire so that he can be heroic and rescue those trapped in the fire. Clearly, it's wrong to start the fire in the first place even if others benefit by being saved.

Moreover, if higher-order goods are enabled by lower-order evils, it seems that we could argue that *higher-order evils* are enabled by *lower-order goods* (Mackie, 1982, p155). We've already seen an example of this; the higher-order evil of torture is enabled by the lower-order good of being biologically "designed" so as to be able to avoid harm. Thus, if we have a duty to lessen evil, and if evil is the route to higher-order good, then we have a duty to *reduce* higher-order good, since it follows from the notion that we ought to lessen evil that underpins it. And, vice versa, if lower-order evils exist so as to enable higher-order goods, this means, absurdly, that we should rejoice in lower-order evil and try to maximise it (McCloskey, 1960, p108, p113).

Secondly, it's not clear whether all lower-order evils even lead to second-order goods, which is precisely the claim of GE. It doesn't seem to be logically necessary that all evils create higher-order goods, unless God exists and is omnipotent and omnibenevolent — which is precisely the claim that is in doubt. A theist has to show that *all* suffering will bring forth greater goods (Rowe, 1979, p338). And, if SMT is true, then anyone can earn heaven just by suffering, no matter what suffering they impose on others. This is parodied online in many atheistic cartoons which show, for example, a victim meeting the criminal who harmed her in heaven, and he explains that he simply "repented," or "had faith" and hence ended up in heaven anyway. This seems absurd. Yet, scripture does not say that we come to heaven through suffering; it says that all that is required is Grace and faith (Ephesians 2:8-9).

The burden of proof here seems to be on the theist. Many physical evils, such as insanity, disease, and animal suffering do not have any morally uplifting effects (McCloskey, 1960, pp106-7). So, for example, whilst disease enables us to pursue medicine as an achievement of great good, this pursuit is only necessary because disease exists in the first place. So even if evil enables some higher-order goods, it says nothing about how much and what kind of evils God should allow, if at all (McCloskey, 1960, p105 et seq.); and if evil enables courage in the face of evil, courage is only necessary because evil exists in the first place.

Objection 2: The “moral bankruptcy” or “anti-theodicy” arguments

A number of writers have argued that proposing a theodicy is in itself morally objectionable, due to *arguments from insensitivity, detachment, and harmful consequences* (Simpson, 2009a, p155). In brief, these arguments claim that just proposing a theodicy is insensitive to those who suffer great evils, in a callously detached way, like a general who calls civilian deaths ‘collateral damage’ (Simpson, 2009a, p159), or a eugenicist who argues that evils ‘improve the gene pool’ (Simpson, 2009a, p162). “We cannot speak of swallowing the Holocaust, as we speak of swallowing the pain at the dentist’s.”¹⁸³ So, Simpson argues, theodicy itself results in bad consequences, because those who believe in theodicies are likely to be resigned towards evil, since they consider it part of ‘God’s plan’. In other words, contrary to the argument above, wherein it was claimed that we need evil to learn to combat it, theodicy would lead us to not combat evil, since it is part of God’s intentions.

Theodicists, Betenson argues, rely on a “one-sided diet” of examples, choosing evils that are plausibly for our greater good (e.g. pain at a dentist), rather than looking directly at the full depth of horror that humans are capable of (Betenson, 2015, p90). Some evils, like the Holocaust, are so evil, that it just is evil in itself to even suggest that there’s a reason for them (Betenson, 2015, p91). To take on a detached perspective is to ignore the horror of evil as it is on earth (Betenson, 2015, p94). Of course, Simpson explains, there are some cases, e.g. medical doctors, who have to maintain a professional distance from the suffering they observe; and perhaps God is like that. So there is some precedent in our experience for distancing oneself from suffering (Simpson, 2009a, p163, p164). But, one can respond, God is often said to be a ‘loving parent’, and the cold, professional attitude of a surgeon, does not quite capture what is meant by ‘loving parent’.

Contrary to the SMT argument, suffering does not lead to heroism (Simpson, 2009a, p155, p160; Simpson, 2009b, p341). A case which has received much publicity since her recent death, is that of Mother Theresa. She openly advocated suffering and poverty in her

¹⁸³ D. Z. Phillips, *The Problem of Evil and the Problem of God*, chapter 2, section 3, para. 19, in Betenson, 2015, p89

Mission.¹⁸⁴ In this way, we see soul-making theodicy and eschatology being used to justify rather than to remediate evil (Simpson, 2009a, p164). Another example is Fisher, Archbishop of Canterbury (1954):

“The hydrogen bomb is not the greatest danger of our time. After all, the most it could do would be to transfer vast numbers of human beings from this world to another and more vital one into which they would some day go anyway...” (in Huberman, 2007, p115).

Theodicy therefore encourages us to not bother about suffering and evil, since it is just part of God’s plan (Tilley, 1991, in Simpson, 2009a, p160, p166; Simpson, 2009b, p341).

“Theodicy, in its very nature, must judge all evils to be ‘ok’, all things considered. If a theodicy is correct, then there is no unjustified [gratuitous], unconscionable evil.” (Betenson, 2015, p93, [my insert]).

Whilst the ‘soul-making’ theodacists will argue that suffering ‘builds character’ (Simpson, 2009a, p157), it seems to be reasonable to specify a limit to the extent to which such suffering is justified (Betenson, 2015, p100). There’s a difference between, say, failing a test, which builds character, and being a genocide victim, which certainly does not.

Theodicy, in short, could be said to offer a “proxy endorsement” (Simpson, 2009a, p157; Simpson, 2009b, p344) or “tacit sanction” for evil (Betenson, 2015, p95; Trakakis in Betenson, p104). Theodicy permits apathy (Simpson, 2009a, p158; Betenson, 2015, p103); it treats people as means to some end (God’s ends), rather than ends in themselves. But Betenson objects, Kant’s imperative is *categorical*; it does not admit exceptions. It is just wrong, Stump points out (1985, p433), to consider that a child’s suffering is a means towards a ‘greater good’, e.g. for the species as a whole. It just is wrong, to take another example, to own a slave, as one treats him as a means towards some end or goal. Moreover, making a slave work harder — that is, suffer more, so that he works even harder towards some ‘greater’ goal — does not make up for the fact that he’s being treated as a means to an end (Betenson, 2015, pp87-8; p101).

Theodicies which just are too “obscene or insensitive” should therefore be rejected (Simpson, 2009b, p343). And if that’s true, and there are some evils which are really “obscene” to try to explain away with a theodicy, then it follows that there probably are some GEs.

¹⁸⁴ Larivée, S, Sénéchal, C., Chénard, G (2012). “Les Côtés Ténébreux De Mère Teresa.” *Studies in Religion / Sciences Religieuses*. 1-27

Objection 3: Theists are supposed to be deontologists

If theists wish to argue that apparent GEs really serve a higher purpose, e.g., to get us into heaven, then theists are making an argument from *consequentialist* ethics. Theism typically relies on deontological ethics like the Ten Commandments (Exodus 20-23:33; Betenson, 2015, p84; p87). Yet SMT requires consequentialism, and this is incoherent with other theistic beliefs and practices (Betenson, 2015, pp79, 80, 84). SMT argues that evil exists *so that* the consequences of entry into heaven are achieved. Yet presumably, as a morally perfect being, God acts because an act just is good, not because it will bring about beneficial consequences (Betenson, 2015, p90).

Hence, under deontological ethics, even if we grant that evils can serve a higher good (even if known only to God), they could still be *evil in themselves*. For example, torturing a detainee at Guantanamo Bay to get information about future terrorist attacks, does not make the torture right, even if the future consequences are a greater good (cf. Rowe, 1991, p81; Schellenberg, 2000, p410). A theist must choose: either evil just is evil and must not be performed, or, evil is acceptable if the consequences are good. Clearly, as a deontologist, a theist should choose the former. Yet, if the theist accepts deontology (“Thou shalt”), he cannot avail himself of theodicy, for theodicy requires consequentialism: evil exists *so that* we can earn heaven and learn about evil and improve human culture; evil exists *so that* we can exercise free-will and choose between sin and obeying God.

So, it follows, it is somewhat inconsistent with general theistic discourse to turn to SMT or theodicy generally. Animals, moreover, are also not generally credited with souls in Christian theology, thus, E2 at least, is not justified by heaven (O’Leary-Hawthorne et al., 1993, p869). SMT does not succeed in such cases.

Objection 4: Learning Morality and heroics

By the consequentialist arguments of theodicists (Hasker, Howard-Snyder, et al.), the “great good” of being able to prevent the Holocaust or heroically combat it, outweighed the evil it represented. But surely five million rather than six million deaths in the Holocaust would have served as powerful a lesson? (Hasker in Rowe, 1991, p85). It doesn’t seem true that learning about evil is sufficiently valuable to outweigh this particular evil. Moreover, this solution — that apparent GEs are didactic — seems one-sided. How did the child in E1 learn anything? How did the fawn in E2 learn anything? How did the Holocaust victims learn anything? (cf. Lewis, 1993, p5). Surely the value in learning is being able to use the learning in later life? But if you’re dead, it’s no help.

This argument also seems circular, in that it entails that evils are self-justifying; evil exists so as to train us to defeat evil. If evil did not exist, we would not need to train up to defeat it in the first place. Like the case where illness is supposedly explained as a way to ensure humans create the great good of medicine, medicine (as a great human achievement),

is only necessary because illness exists in the first place. God should just not make illness in the first place. Or consider the arson example again; firefighting, as a great good, only exists because of fire (evil) existing in the first place. Morality, therefore, is only a serious issue *because* evil exists, without evil, we'd not need to worry about morality.

Why, moreover, does God have to teach us about morality through evils? Why not say that God has to have a certain minimum level of gratuitous *goods* to remind people of morality? Does this 'didactic' argument mean that if no-one does enough evil to remind people of the significance of morality, that God would have to step in and *create* a quota of evil? (Rowe, 1991, p82; Howard-Snyder et al., 1999, pp125-127). If performing evil is necessary to help us learn about evil, "the prohibition against doing evil makes no sense," since doing evil would then provide us great learning (Rowe, 1991, pp81-2). This means that we *should do evil*. Which, again, is absurd.

Bayesian Conclusion

Recall earlier that Draper presented us with this argument:

- i. $P(J|E1 \& k) < 0.5$ [It is unlikely that E1 is justified, i.e. E1 is probably a GE]

If theodicy were true, then (i) would be false, since E1 would be justified. That is, p^* would be true. However, since it seems that theodicy fails to justify evil, it means that $P(J|E1 \& k) \ll 0.5$. From this it implies that

- iv.* $P(G|E1 \& k) \ll 0.5$

Or, it is highly unlikely that God exists, given the evidence of apparently gratuitous evils.

Skeptical Theism

*"For my thoughts are not your thoughts,
neither are your ways my ways." — Isaiah 55:8*

Betenson (2015, pp91-2) says that whilst we can argue from "there are some justifiable evils", we can't infer from that, to the view that there are *always* justifications for evils. At most 'some $x...$ ' entails that 'it is possible that all $x...$ ' (Plantinga in Betenson, 2015, pp91-2). In other words, even if some evils are justified, it does not entail that all evils are justified. In short, we should discard theodicy, and instead, claim, like Plantinga does, that there *might* be some future greater good, and we're just too ignorant or limited to know about it. This is the

position known as Skeptical Theism.¹⁸⁵ Skeptical Theism is the position that due to our limitations, we can't know what God's good purposes for certain evils are (see also Simpson, 2009a, p154; Pereboom, 2012, 2013). "Our understanding of what is good and bad" Swinburne tells us, "is very limited." (2004, p113). There are a variety of forms of Skeptical Theism (ST). I will deal with these:

1. **The Good* argument.** God's idea of good is something radically different to our own.
2. **The lack of omniscience argument.** We're just too limited to know what the future goods will be.
3. **The intellectual limits argument.** A third form argues that we simply are not able to see how earlier evils are both causally and logically linked to later, greater goods; we're simply too unintelligent. That is, we can't know that any specific evil will not at some later stage yield greater good.

*Argument 1. God's idea of good is something radically different to our own; Good**

There are a number of arguments that claim that God's moral sense is radically different to ours. God, on this type of argument, is not part of our moral community.¹⁸⁶ "God ... has a vast amount of knowledge about good and evil and how they are related that humans do not have" (Draper, 1989, pp345-346). Some evils can, even in our own understanding, be re-cast as goods. For example, mass slaughter can be characterised as a 'great military victory' (Mackie, 1982, p163). Thus, it is possible to change our understanding of what we have up until now called 'evil', and see it as a form of good.

Let us suppose, then, that there is a property called *good**, which is a superset that includes what humans call "good," and it includes all of God's choices. On this model, God is not so much all-good, as all-good*. The fact that God allows what we call 'evil' is actually just an example of good* in action, and we simply misunderstand what good* is. Moreover, since we have progressed in our value systems, there is reason to think that there may still be areas of ethics which we do not understand, nor their conditions of realisation. Hence, we may be yet ignorant of what the good really is (O'Leary-Hawthorne et al., 1993, p862, p866). Therefore, the skeptical theists conclude, all evils have a purpose; we just don't know what it is.

¹⁸⁵ This argument is also called the appeal to omniscience (O'Leary-Hawthorne and Daniel Howard-Snyder, 1993, p864), the infinite intellect defence, agnosticism, or the ignorance defence. But most authors call it "Skeptical Theism".

¹⁸⁶ Hasker, 2007, p155-6; Mackie, 1982, p156; cf. Swinburne, 2004, p116; cf. Simpson, 2009a, p158

Objections to Argument 1

First of all, dismissing known evils as “not really evil” on the grounds of a mere speculative and different moral system, when we already know of a moral system, is implausible (O’Leary-Hawthorne et al., 1993, pp866-867).

Secondly, if evil is actually part of good*, and if we should try to be more like God, then presumably we should try to maximise good*, or what we normally call ‘evil.’ This means that we should promote evil. *Reductio ad absurdum*.

Thirdly, this also means that there’s no ready distinction between good and evil, since they are indifferently acceptable subsets of good*. This makes our normal terms ‘good’ and ‘evil’ hard to distinguish. We wouldn’t be able to tell what we ought to do or not do, since it is all good* anyway (Mackie, 1982, p156). As we argued above under anti-theodicy, saying that any event is just good* anyway, means that we will be apathetic towards evil, rather than take action against it, as presumably a good God would want us to, since we have free-will.

Lastly, the claim that we don’t use the same standards of good and evil as God, is scripturally speaking, false, since the “Fall of Man” was due to man eating the fruit of the knowledge of good and evil, and becoming morally “like” God (Gen. 1:27, 3:22). So we do have the same notion of good and evil that God does, according to scripture. The argument fails.

Argument 2. We’re just too limited to know what the future goods will be

Suppose that God nonetheless has plans which unavoidably require the existence of certain evils, which we could not understand (Swinburne, 2004, p116; Schellenberg, 2000, p415). “Our understanding of what is good and bad is very limited.” (Swinburne, 2004, p113). Were this the case, we would not be able to claim that any evil is purposeless (Hasker, 1984, p216), since we could not tell whether any particular evil had an ultimate greater goal. We would only be justified in believing this if we could demonstrate that the evil lacked any purpose (Rowe, 2006, p83; O’Leary-Hawthorne et al., 1993, pp862-3). Like a baby not understanding his parent’s motives, we cannot understand God’s.¹⁸⁷ It would be remarkable indeed, if an omniscient being’s reasons did not exceed our grasp.¹⁸⁸ Hence, we cannot infer that God would prevent evil. At best, we can claim that some evils are just *apparently* pointless (Plantinga in Rowe, 1991, p71).

Of course, the immediate reply available is to argue that theism can’t demonstrate that God only permits evil that serves a higher purpose (Hasker, 1984, p217). But that doesn’t mean that the evils *don’t* have a higher purpose.¹⁸⁹ It just means we can’t see them. Coley calls this “Axiological skepticism” (Coley, 2015, p54). “We shouldn’t think that the possible

¹⁸⁷ Plantinga and Wykstra in O’Leary-Hawthorne et al., 1993, p864; Rowe, 2006, p87.

¹⁸⁸ Alston in O’Leary-Hawthorne et al., 1993, p864, Draper, 1992, p310, Wykstra in Rowe, 2006, p82

¹⁸⁹ Wykstra in Rowe, 1991, p76, Wykstra in Wilks, 2004, p312

goods and possible evils that are known to us are representative of all possible goods and possible evils there are” (Coley, 2015, p54). We have no reason to think that all goods need be within our ken, or that the samples of goodness that we’ve seen thus far, are objective and exhaustive. We must assume that our inductions from the types of goods with which we are familiar, might not apply to future types of good with which we are unacquainted. There might well be some type of good ‘out there’ that *does* justify apparent GEs (Draper, 1992, pp312-313). Since these end-point goods would not likely be a kind of good that we are acquainted with, we would be even less likely or able to conceive of them, or see how they arose from the evils.¹⁹⁰ So, where “justifications are all within our ken” is J, and “there are *no* justifications for purposeless evils” is N, Draper argues that the proposition $J \supset N$ requires a premise S:

“S: We have good reason to believe that the sample of goods referred to by [J] is representative of all goods.”

But S, Draper claims, is false. We cannot demonstrate S (Draper, 1992, p311).¹⁹¹ We don’t need to know that the goods do justify E1 and E2, we just have to accept that some goods *may* justify E1 or E2, without us having to know that they do or what they are (Plantinga, 1998, p534).¹⁹² Therefore, we do not know whether evil serves God’s good purposes, and therefore, we cannot claim that evil is evidence against God.

Objections to Argument 2

a) Surely we should know about the kinds of goods?

We do tend to assume, using our normal inductive practices, that the goods we will encounter in the future will resemble the goods we know of as already existing in our experience. For us to recognise something as justified, it should be sufficiently similar to the kinds of goods that we’re accustomed to. Unless the future good is sufficiently similar to goods we already know, we simply will not recognise it as such, and we will need lots of evidence and explanation to show why it is in fact a good, when it looks very much like an evil. And we already dismissed the argument from *good** earlier.

Hence, if apparently purposeless evils are in fact ultimately justified, we *will* be able to imagine conditions of their justification. But none of the goods in our ken are adequate to justify E1 and E2 (Rowe, 1991, p73). Only a good that is substantially better than the ones we know of could ameliorate such great evils (Rowe, 1991, p74). We need to *know* that something really good came out of the apparent purposeless evil to claim that it is likely not

¹⁹⁰ Wykstra, op. cit.

¹⁹¹ Draper has E8 & P & S, where E8 = Rowe’s E1, J = Draper’s P.

¹⁹² Note that Draper is not defending theism in this particular paper; he usually argues against theism.

purposeless. Yet in the case of E1 and E2, it's not evident that anything good can come of them.

Why, moreover, would God obfuscate his plans and make it impossible for us to understand why he has allowed evils?¹⁹³ How would that world be 'better'? (Rowe, 1991, p78). If we could at least see God's plan or the reasons for evils, they would not be so terrible. So until an acceptable reason is provided to explain the obscurity of the 'goods' that evils are purported to lead to, it is fair to infer that they do not exist (Rowe, 1991, p79).

There is at least one reply which might work here. If God's reasons were perfectly clear, then God would be, in a sense, revealed to men for all to see, and, as such, his presence would be known. And if God's presence were common knowledge, no-one would dare perform any act of evil, no matter how small, since it would be known that God would observe it. From this, it follows, that if God were to reveal himself, he would in fact impinge on our free-will, to choose between good and evil. Thus, a theist could argue, the reason God's reasons are inscrutable is simple. And, it follows, as a result, we cannot expect to know God's reasons for evil. However, this argument again implicitly assumes that libertarianism is the case. For if compatibilism is the case, then the theist cannot make the case that the revelation of God would impinge upon our volitional liberty. Only if the mere knowledge of the existence of God was necessary and sufficient to cause us to refrain from performing evil, could we be said to have lost free-will due to God's being revealed. Yet it seems that we could still perform evil even if we knew that God existed, simply because, like Satan, we might merely wish to freely defy God.

Moreover, even if it is true that God does not want to reveal himself, once the goods that God intended to happen have happened, the goods would *no longer* be beyond our ken (since we had now experienced those goods). So, we cannot argue that God allows evil because of goods that are forever beyond our ken (Rowe, 2006, p85). Just because God knows more than us in general does not mean that we are ignorant of a certain domain, such as morality (O'Leary-Hawthorne et al., 1993, p865), or why God will permit evil (Draper, 1989, p345).

Suppose, furthermore, that the best possible kind of good in the universe is atonement with God in heaven (Nagasawa et al., 2004, p1). If the greatest good is heaven, then the goods that we know of, *are* indeed representative of all the goods that there are. So we're not that ignorant (Rowe, 2006, p89). If there was a better good than heaven, then *that* would count as heaven, and heaven as we know it would be yet another lower state. The theist has to argue that heaven is so much better than any good we know of, that it can justify absolutely any evil. But we have very little detail about the afterlife to convince us that it is really that good (O'Leary-Hawthorne et al., 1993, p868). This view — that the joys of earth are 'inferior', is also an insult to creation, for God saw that "it was good" (Genesis 1:11). Thus,

¹⁹³ Hick, for example, and Swinburne maintain that God must hide Godself and divine reasons in order to allow us to freely decide to align ourselves with God. I thank Eshleman for this observation.

we have no strong reason to believe that some mysterious unknown goods exist which will ultimately justify apparently purposeless evils (Rowe, 2006, p90). Lastly, and again, since animals are generally not credited with souls or a place in heaven, it follows that heaven does not justify E2.

b) The extent of consequences

Skeptical Theism (ST) is arguing that we cannot reliably discern whether an evil is purposeless, because we can't see all its later consequences (Wilks, 2004, p316). But consequences are infinite; so how long must we wait for God's good plans to come to fruition? What if one of my descendants, in a thousand years from now, turned out to be a mass murderer? Does this make my life a bad life? And this raises the question of what makes any consequences good or bad. Even if some future good, with which we're unfamiliar, can justify terrible evils, there might well be some other greater future good, with which we're also unfamiliar, which is achievable only by preventing those terrible evils (Rowe, 1991, p77). Indeed, it may be that our suffering here will benefit some other beings in another world, whom God favours, such as aliens or angels; so the ultimate good that our suffering serves might not even be a boon for us (Rowe, 2006, p91, cf. Mackie, 1982, p158). Thus, if apparently GEs are not to be actual GEs, the ultimate goods that they promote ought to be goods that clearly benefit us reasonably soon, so that we can see the connection between those evils and our benefits (Rowe, 2006, p87).

If ST is true, we cannot say with confidence whether *anything* is evil (Wilks, 2004, p317), because, again, of the extent of the consequences. The same applies to good; we can't tell if a good will later cause great evil (Wilks, 2004, p317). Yet if we required omniscience ourselves in order to see whether a thing is really good or evil in the long run, we would have no ability to tell, at the time that we make the decision (Wilks, 2004, p318). We'd be morally paralysed. The theist has to bite the bullet and state that *all evil is apparently justified* if ST is true. But that will lead to moral cynicism. If there's no such thing as an evil which does not serve God's plans, regardless of whether we know about it, there's really nothing to say why we shouldn't perform or tolerate the most terrible evils since ultimately it will always turn out good as part of God's plans (cf. Oppy, in Betenson, 2015, p85, also Betenson, 2015, p86). This will, then, lead us to moral apathy; *laissez-faire* (cf. Betenson, 2015, p86, p103). Any evil will turn out good, so we need not act against evil. This is absurd.¹⁹⁴ And this plays into the criticism given earlier of theodicy, that is, that it condones evil.

¹⁹⁴ It is beyond the scope of this chapter to discuss whether we can solve the problem of how to choose to do the right thing in the context of unknowable future causes, broadly speaking, as a problem in ethics.

Argument 3: That we can't know that any specific evil will not at some later stage yield greater good

Coley argues that there is a third form of ST, namely *modal skepticism*. Our knowledge of the logical relations between certain evils and subsequent goods is too limited to prove that there's no logical relation (Draper, 1992, p304; Simpson, 2009a, p154). Modal skepticism argues that though we understand the entailment relations between goods, evils, and the prevention of evils leading to goods, we shouldn't think that our understanding exhausts (or fully represents) all possible understandings of modal relationships, or, that there might not be other entailment relationships which can lead from evil to future goods (Coley, 2015, p54; Bergmann in Coley, 2015, p56). What it means, for the skeptical theist, is that we don't know that these evils here now, may not entail or cause a later good by some unknown mode of necessitation. And as such, we can't claim to know that God doesn't have some plan for this current evil, such that it causes a later good (Coley, 2015, p56).

Responses to Argument 3

a) We understand necessitation. *Pace* Hume, it seems that our understanding of causal relationships is good; we have laws covering efficient causation (Newtonian Mechanics), we have equations for quantum mechanics (even if we don't understand how it all occurs), and we understand chaotic causal models based on probability, statistics, and reverse-engineering data sets to discover hidden factors and regularities ("autocorrelation"). So, I believe we do understand the possible modes of causation from an evil event, to a possible greater good, and could quite readily develop predictive models. The failure is not to do with our understanding of "entailment relations"; hypothesising that there are such "other modes" of necessitation is *ad hoc*. Instead it's about practical limits of predictability in a quantum- or chaotic world. It's not that we don't understand how cause and effect might work, it's primarily about our ability to see the future, and how a particular evil here now could be a necessary antecedent of a future outweighing greater good.

b) We can potentially construct a thought experiment to demonstrate that GE is logically possible. For, if theism is the case, GE should be logically impossible, since *truly* purposeless evils would not be possible in a universe ruled by an omnifarious being. Here is an attempt. Suppose in a very distant galaxy there is a planet P inhabited by an alien being, A. And suppose A is a thoroughly malevolent being who always does evil whenever it can. Suppose A tortures and kills a fellow sentient being, victim V. And suppose A performs his evil just for a vague sense of amusement. Suppose further that the amusement A derives is minor (as he's so inured to acts of violence). Take it further that V learns nothing of any use (V's dead), and the suffering that V experiences is vastly incommensurate with the amusement that A experiences. Let's call this evil E3. Suppose further that P is swallowed up in a black hole immediately afterwards, just as A finishes performing E3, and A and all his fellow beings on

P, who are morally innocent, are annihilated instantly. Suppose that these beings, including A, do not suffer any pain because the death is instant, and that therefore, a theist could not warrantably assert that the black hole was “punishment” for A. Suppose further that that black hole then collapses inwards to an infinitesimal point, and never, ever interacts with any matter further in time (that is, heat death occurs); and that the matter it sucked in never gets re-used (it cannot escape), and no events that transpired on P are ever heard about by other sentient beings elsewhere, and therefore serve no educative purposes. It seems that not only is this scenario possible, but that E3 can serve no future greater good, and is therefore a true GE.

The demand for consistency

We now get to the final objection to ST which we hinted at in Chapter 8 when we considered whether God would even make this world.

“One could hold that... one sees little reason for God to create a life-permitting universe. ... If God were to exist, the ways of God would be so mysterious that we couldn’t make any reasonable predictions about what God would or wouldn’t do.” (Narveson in Monton, 2006, p418).

ST claims that we just do not know why God allows evil. But, in the same breath, theists might make claims about eschatology, theodicy, and cosmology. This, we may argue, seems incoherent (Wilks, 2004, p313-4). Skepticism against the problem of evil can be leveraged against other arguments which depend on claims to know about God. If we can’t know God’s intentions in allowing evil (so the theist says), because we’re limited, we also likely can’t know God’s intentions in creating the world, because we are limited. Relying on ST therefore undercuts the programme used to justify theism (Wilks, 2004, p318; Keller, 2010, p160), and thus ST seems to undercut the cosmological argument.

Consider theodicy. A weak theodicy, Coley holds, is one which expresses the view that there *may* be a God-justifying reason for evil (2015, p57). And Plantinga, as we know, calls this a “defence”. A strong theodicy, however, is one which expresses the proposition that there *is* a God-justifying reason for evil. And this, Coley says, is incompatible with skepticism. For the theist needs to claim strong confidence in her credences in both cases.

Suppose the strong theodicist claims that there always¹⁹⁵ exists a future good *g* such that if God allows evil *E*, *g* will occur. Thus, since *E* exists, we infer that God is aiming to ensure that *g* occurs. But, for all we know, if ST is true, there may be some future good *g**, which is much greater than *g*, which requires God to prevent *E*. If God fails to prevent *E*, and thereby secures *g*, he will fail to secure the much greater good *g**. Rowe makes this

¹⁹⁵ Betenson makes an argument for the word “always” (2015, p86).

argument, too (Rowe, 1991, p77). But the skeptical theist does not know that g^* doesn't exist, because of his skepticism. So, he cannot with confidence claim that God enables E so as to enable g , because skepticism makes it a live possibility that g^* exists, too, which God, *qua* omnibenevolent, should prefer (Coley, 2015, pp58-59). From this, it follows, that the theist cannot claim that God allows E for good reasons.

There are a variety of possible theistic responses. One is that there is no fact of the matter pertaining to which good God should actualise, because it's a matter of moral indifference. However, that's clearly false, since we already said g^* is much greater (Coley, 2015, pp58-59), and we rejected the argument from *good** — the possibility of the unknowability of types of goodness — earlier. A second theistic response could be that God would then, in fact, realise g^* rather than g . Well, yes, he ought to. But that doesn't rescue the strong theodicy, which states that God allows E because of g . It will replace that theodicy with a new one that God ought to *stop* E because of g^* (Coley, 2015, p60). Therefore, again, the theodicy would fail, because God doesn't stop E.

The last, and most plausible theistic option, then, is that there might be an aggregate future good (g^{**}) which is realised by allowing E, where g^{**} is brought about by g and other goods, such as g^* , arising from allowing E (Coley, 2015, p59). This, however, requires that the theodicy provide an explicit list of those other goods that conjoin with g to create g^{**} ; he'd have to show that g^{**} definitely exists, and it requires that the theodicy know about the hypothetical g^* and show that g^{**} is better than g^* alone. Since the theodicy, due to skepticism, does not know about g^* , he cannot know that g^{**} is the best actualisable future good, better than g^* (2015, p60).¹⁹⁶

But as we can see, this speculation leads us nowhere. It's more elegant to assume that E does not give rise to future goods at all, if we can't see what they could be.

“[W]e have no idea what are the intentions of God, if he exists”.¹⁹⁷

Since theodicies assume that we *know* what God's intentions are in allowing evil (Rhoda, 2010, p7), a theist has to strongly claim to know that ST is compatible with the existence of evil, due to a theodicy. But if ST undermines theodicy, because ST holds that we cannot know God's reasons, the theist then cannot claim that theodicy is compatible with ST. ST therefore doesn't help the theist (Wilks, 2004, p319), and in trying to answer the problem of evil, ST actually serves to undermine important theistic arguments (theodicy, cosmology, eschatology), because ST claims we know nothing of God's plans for events in this world.

Where the *cosmological* argument is concerned we can't say with great confidence that God would create a world such as this one if we can't say what God's plans are. Recall, earlier, we argued in Chapter 8 that *this is not the sort of world God would want to make*, and, one of the reasons we gave, was evil. It seems dialectically awkward to claim that we'd

¹⁹⁶ I use g , g^* and g' , where Coley uses G , G^* and G' , because earlier I used G to mean theism.

¹⁹⁷ Swinburne paraphrasing Mellor, in Swinburne 2004, p132

know why God wanted our world (the cosmological argument), but not why he wanted evils upon it (the Skeptical Theist's argument).

Moreover, it also seems dialectically awkward to claim to know about *eschatology* under Skeptical Theism. For how can we claim to know about an afterlife (and the rewards thereof) without knowing why God creates evil? The same applies to *theodicies*. If God allows evil because of free-will or soul-making, again, we need to first show that we know what God's plans are for evil. A Skeptical Theist could at most rely on a *defence*.

So, let's call this argument the **Requirement of Consistency Argument**:

RCA: Either the theist is gnostic about God's reasons for evil, eschatology, and God's reasons for creating the universe, or none of these. Since the only solution to the problem of evil is to deny knowledge of God's reasons for evil (Skeptical Theism), it follows that the theist should not claim to know why God created the universe. Therefore, the theist should not offer the cosmological or teleological arguments if Skeptical Theism is true.

The theist would need some *principled* reason for saying parts of God's plan were transparent and other parts were not; that is, why God would reveal his plans for creation and eschatology, but not reveal his reasons for evil. It is not apparent that the theist has anything plausible to offer here. Let's put it another way. The theist is claiming *that* God created this universe (with its apparently gratuitous evils), and claims to know *why* God created this universe (with its apparently gratuitous evils). Yet the theist claims to *not* know why God created the universe *with its apparently gratuitous evils*.

Thinking again in Bayesian terms can clarify the dialectical situation. Skeptical Theism amounts to a claim that we cannot ascertain a value for Draper's (i) above. Recall that Draper claimed that:

i. $P(G|E1 \& k) < 0.5$

In effect, ST claims that we cannot assign a meaningful value for the right hand-side, or at least any value that is independent of a decision to believe or not. That is, in order to assign a value to the right-hand side here, you first have to have decided whether or not you believe in God at all. One might interpret a fideist position, for example, as the view that through faith we can accept God's existence, and we can then be inclined to value (i) differently. Unfortunately, this would be entirely question-begging in an evidentialist setting, since objective evidence for God's existence is what is in question in the first place.

Now, once we accept $P(G|E1 \& k)$ is not defined, we adapt one of White's criticisms of MUT in the previous chapter to illustrate the profound nature the problem for the skeptical theist, as follows.

Skeptical theists may believe that they can separate their skepticism about the problem of evil from the cosmological argument. In Bayesian terms, they might express their

view as follows. Let L be the proposition that there is a life-capable universe, and GE be the proposition that there exist apparent gratuitous evils. The optimistic Skeptical Theist might say she has grounds for thinking that:

- $P(L|G)$ is high (the cosmological argument) but
- $P(GE|G)$ can't be evaluated given the inscrutability of certain parts of God's plan (Skeptical Theism).

In both of these cases what is being assessed must be a certain *type* of universe – a life-capable one; and one which from the limited human perspective appears to contain GEs. Understood this way, it is not obviously inconsistent for the theist to maintain these sorts of credences. It may, however, still at least seem intellectually awkward (or apparently inconsistent) to hold such a view, as we argued above in **RCA**. For what could warrant this confidence in one aspect of God's plans but ignorance in another? Leaving that awkwardness aside, there is a more serious problem which White's (2000) discussion helps bring to light.

The actual evidence that we have on hand is the evidence of our universe, e , as we have called it. e belongs to both L -type and GE -type universes. Hence e entails both L and GE and so $[e \& L \& GE]$ is equivalent to e . Now let S be the content of e minus $L \& GE$, so:

$$e = S \& L \& GE$$

From this it follows (by definition) that

$$P(e|G) = P(S \& L \& GE|G)$$

If we are assessing $P(G|S \& L \& GE)$, in other words, if we are updating on all our evidence, then that value will depend on $P(GE|G)$ — that is, the likelihood that apparently gratuitous evils exist, given God. If this value is undefined, as the Skeptical Theist tells us, then *so is the whole expression*. Hence, when a skeptical theist tries to update on all their evidence, they are forced to conclude (whatever force they take the cosmological argument to have) that $P(G|e)$ is undefined. Here, then, we have a neat rendering of the moral of **RCA** in probabilistic terms.

In sum, either the problem of evil is a serious problem, and implies that a good God probably does not exist, or, we are so ignorant of God's plans that we are unable to determine what determine whether any apparently evil event is indeed gratuitous (and hence, we also can't say that God wanted evil for eschatological purposes, or that God wanted to create a world containing evil). This option that we can't tell whether evil is gratuitous, can be grasped by the theist, but on pain of inconsistency; for she must then surrender natural

theology. Such theists who choose this option are fideists or voluntarists. But whether fideism is feasible is beyond the scope of this thesis.¹⁹⁸

Inscrutability, Skeptical Theism, and Simplicity

It seems to follow that if God is inscrutable on the matter of evil, as argued by Skeptical Theism (ST), due to God's reasoning being "beyond" our comprehension, this supports the **DCA** argument from Chapter 6 — that God is extremely complex. Therefore, God is not simple if ST is true.

Conclusion — the Hypothesis of Indifference

*"I form the light, and create darkness: I make peace, and create evil:
I the Lord do all these things." (Isaiah 45:7)*

Given the foregoing arguments, it seems implausible to persist in holding the view that there are evils that have no purpose and yet God does nothing about them. It seems more probable, instead, that God is just not omnibenevolent. It may be more coherent to believe in a God who allows evil — something like Deism perhaps. Draper presents us, then, with what he calls the Hypothesis of Indifference:

HI: "Neither the nature nor the condition of sentient beings on earth is the result of benevolent or malevolent actions performed by non-human persons" (Draper, 1989, p332; also in Silver, 2002, pp340-348).

If we accept HI, we are left with a different form of theism which can at least potentially be an explanation for cosmology, a cosmology in which evil is merely a side-effect of the laws of nature, serving, for example, to enable biological evolution. But this entails abandoning classical restricted theism.

¹⁹⁸ Dawes (in review of this thesis, 2015) observes that the inconsistency between the view that we know why God would create and did, and ST, is only a problem under an evidentialist paradigm. This is because evil stands as evidence against an all-loving God. A theist who holds that evil is incarnate in the Devil, or that evil is revealed, or that it merely constitutes disobedience of God, or who holds his belief in God due to faith (fideism), rather than evidence (or counter-evidence), need have no major concern over evidence of evil. (cf. Bishop, 2007a).

12. Conclusion

This thesis has presented inductive and probabilistic arguments for and against theism. In the earlier chapters, it focused on the arguments from Richard Swinburne.

The thesis started with the argument that the only compelling evidentialist support (natural theological argument) for theism is the cosmological argument. This claim was made in the Introduction chapter. We then presented Swinburne's arguments. Firstly, this universe's structure and life-supporting capacity is improbable (Swinburne, 2004, p49, p150), given the stringent "finely-tuned" requirements for life (Leslie, 2000, p12), and the Second Law of Thermodynamics (Giancoli, 1990, p396). In other words, the probability of the existence of this kind of life-capable universe is low ($P(e)$ is low). Moreover, this universe's structure and life-supporting capacity is evidence for theism; that is, the probability of this universe existing is greater on the hypothesis of theism than the hypothesis of physicalism ($P(e|h)$ is high). And finally, Swinburne argues that a theistic explanation for the universe is more probable because theism is simpler — $P(h)$ is high (Swinburne, 2004, p98). Swinburne gives three reasons for this: that theism is a *personal* explanation, that theism is *quantitatively* simple (one God), and that theism is *qualitatively* simple (God's properties are infinite).

We then looked at the detail of Swinburne's cosmological argument, from a Bayesian perspective, first explaining what Bayes' Theorem is. However, we identified problems for Swinburne's argument, as follows. Firstly, we needed to be able to fix the prior probability of theism, that is, how probable theism is prior to any considerations of evidence, $P(h)$. Yet, we argued, whilst we can do this in a scientific context for an hypothesis with objective measurables, it's not feasible in a theistic context. That is, we claimed that we can't fix the priors. The objective ways of doing this — like appealing to frequencies — are inapplicable in the theistic context. We can't appeal to the Principle of Indifference either, since that is arguably incoherent, and moreover, there is no non-arbitrary way to divide up the space of possible hypotheses, particularly as there are many competing alternatives to theism which may be plausible.

We saw that Swinburne claimed that we fix the priors with the concept of simplicity. Swinburne thinks his views on simplicity ground not only the use of simplicity considerations in arguments over the existence of God but also how simplicity is used in scientific contexts. If this were so, then that would be a powerful reason to accept Swinburne's argument. However, as I showed in my discussion of the use of simplicity judgments in scientific contexts, this is not the case. Appeals to simplicity in science function in many ways but in general they make implicit appeals to background knowledge. As Sober and Norton point out, background knowledge determines our choice of theory, not generally speaking, the simplicity of the hypothesis. Since the cosmological argument is meant to run independently

of background knowledge, or so Swinburne tells us, such judgments about background knowledge cannot be guiding our inference. In effect, this means, that Swinburne lacks any way to fix the priors objectively; or at the very least the notion of simplicity he is appealing to, is completely different from that in play in the sciences.

We then saw arguments from Sober (1994, 2015), where he shows that Occam's Razor isn't the be-all and end-all of scientific decision-making, so not even Occam's Razor can tell us that, as an additional entity, whether God is valuable as a theoretical entity. And if God is meant to be an ultimate explanation, and if he's contingent (as both Swinburne¹⁹⁹ and Bishop²⁰⁰ suggest), God doesn't in fact explain the entire series of contingent things, as he can't explain himself. As such, God is just an alternative brute contingent fact, to materialism's brute contingent fact that matter (energy) always existed. We then explained that this undermines P-inductive arguments, in particular, the cosmological argument. We showed that, of mathematical necessity, either theism is improbable *a priori*, or, the universe is not improbable *a priori*, or, theism is a poor explanation.

Then we considered whether God is a good explanation, even if he is not simple. That is, we considered whether theism has a high likelihood, given the evidence of this universe. In other words, we then turned to consider whether Swinburne could be thought of as providing a strong C-inductive argument by considering whether the God hypothesis explains the existence of the universe. In Bayesian terms we wondered whether $P(elh)$ was high or more precisely $P(elh) > P(el\sim h)$. We rehearsed some reasons for thinking God would create a world like this but any such arguments quickly encounter problems. Why didn't he create more good people? Why didn't he do it more efficiently? Why did he create so much which is so lifeless? These arguments undermine any straightforward idea that $P(elh)$ is high. We therefore concluded that there is no C-inductive argument from cosmology to theism, because of the likelihoods.

We then considered physicalist explanations of the universe. These cannot conclusively show that $P(el\sim h)$ is high. This might lead the reader to think that we have arrived at an argumentative stalemate, but in final substantive chapter, we turned to the problem of evil. Without relying on prior probabilities of atheism, and re-entering the Bayesian problems raised for theism, we saw that one way to object to theism is to point out the possible existence of Gratuitous Evils (evils which achieve no good ends). *Prima facie*, evil does indeed provide good reason to think that $P(el\sim h) > P(elh)$ and indeed as we showed in our presentation of Draper's argument possibly provides a successful P-inductive argument against theism in a way that avoids the problem of the priors. We then saw that the most plausible response to the problem of Gratuitous Evil is Skeptical Theism, that is, that we are

¹⁹⁹ Swinburne, 2004, p94

²⁰⁰ Bishop, 2007a, p401, but not contingent on a necessary being.

unable to know God's intentions. But that stance undermines the cosmological argument. That is, if we can't know why God allows evil, we can't know why God created. I then suggested that Draper's argument for an indifferent deity could be plausible. That is, that there may be some reason to accept the hypothesis of indifference (HI).

We then concluded that, given that the cosmological argument is the most compelling evidential argument for theism, and that it fails, that the theist can offer no strongly compelling evidential argument for theism. Therefore, holding the fideist/voluntarist position, or the HI, are stronger stances.

We saw a number of detailed novel arguments in support of the above argument flow which show that natural theology fails. Most saliently:

1. **Indeterminate P(h):** That there is no way to fix the prior for theism, $P(h)$ In particular I show that none of the standard ways of fixing priors work in the theistic case and there are no grounds for thinking that simplicity is a guide to probability. The latter is argued by showing that there are no grounds for thinking Swinburne's account of probability plays any role in theory choice in the sciences as Swinburne claims it does; hence there is no good reason to accept it plays a role in his argument for theism.
2. **The Divine Complexity Argument, DCA:** Even setting aside (1), an omniscient deity is necessarily the most complex being in existence, and therefore, if $P(h)$ is proportional to simplicity, as Swinburne tells us, or inversely proportional to complexity, again, $P(h)$ is maximally low.
3. **The No-creation Arguments, NCA:** I argue that (1) God would not create, because perfect beings do not have wants or desires. (2) If God is perfect, he could only make existence worse by adding imperfect beings such as ourselves. (3) If *Creatio Continuans* is the case, and God could foresee, due to his omniscience, that he'd have to sustain evil moment-by-moment, he'd rather not create. (4) It's an overkill to make such a large universe of inanimate matter for such a small number of moral beings.
4. **Divine Indeterminacy, DI:** It is indeterminate, and indeterminable, which universe God would have chosen to actualise, since God would have reason to actualise any universe from a likely infinite selection of good-enough possible universes. Where n are the number of creatable logically possible good universes, the probability of God creating our universe is $1/n$. Thus, the likelihood of theism, $P(elh) = 1/n$. Theism fails to explain our universe.
5. **The P-inductive Threshold Inequality, PITI:** 1. that $P(h|e) > P(\sim h|e)$ iff $P(h).P(elh) > P(\sim h).P(e|\sim h)$. In other words, only if the numerator of Bayes' Theorem is greater for h than for $\sim h$, can we claim to have a P-inductive argument for theism. Even if the theist can establish that $P(elh) \gg P(e|\sim h)$, that is, theism explains our universe, this will only serve to establish a P-inductive argument if $P(h)/P(\sim h) > P(e|\sim h)/P(elh)$. If there is no way to fix

$P(h)$, then there can be no grounds for thinking that inequality is ever satisfied. This establishes that there can be no P-inductive cosmological argument for theism, and indeed, for atheism (except in some special cases illustrated in the chapter on the problem of evil), unless we can fix $P(h)$. In addition, it is argued that it is probabilistically incoherent to hold that $P(e)$ is low, $P(h)$ is high, and $P(elh)$ is high. Yet this is precisely what Swinburne's argument, which connects simplicity to high probability, requires.

6. **Requirement of Consistency Argument, RCA:** Either the theist is gnostic about God's reasons for evil *and* God's reasons for creating the universe, or neither. The only solution to the problem of evil, *pace* theodicy, is to deny knowledge of God's reasons for evil (Skeptical Theism, ST). However, if ST is the case, it follows that the theist also cannot know why God created the universe, or hold a theodicy or eschatology. Therefore, the theist cannot offer the cosmological or teleological arguments; that is, the theist should surrender natural theology.

Instead, it seems to me that people believe, as Bishop (2007), Plantinga (2008), and Van Leeuwen (2014) claim, because of faith; that is, people do not believe because of evidence; they *just believe*. This means that the question of God's existence is to be determined not by considering evidence and probabilities, as Swinburne does, but, I think, on the matter of issues like logical coherence, psychology of belief, geographical coincidences (that people generally accept the dominant religion of their region), and other reasons. So, for example, we might find that, as Dennett argues, theism exists because of the "intentional stance", that we take it that there's a design or intention behind events and phenomena. Or we might argue that theism is internally coherent (or incoherent), and therefore believable (or not).

So, if this thesis has shown anything, it is this: that there no particularly convincing evidence for theism. What remains to be established is whether a consistent voluntarist epistemology can support theistic faith, but that is something for future work.

Bibliography

1. Ariely, D. (2008). *Predictably Irrational*. London: Harper
2. Bandyopadhyay, P. S., Brittan, G. Two Dogmas of Strong Objective Bayesianism. *International Studies in the Philosophy of Science* 24, no. 1 (March 2010): 45 - 65. doi:10.1080/02698590903467119
3. Barnes, L. A. (2011). The Fine-Tuning of the Universe for Intelligent Life. *Publications of the Astronomical Society of Australia*. DOI: 10.1071/AS12015. <https://arxiv.org/abs/1112.4647>
4. Barrow, J. D., Tipler, F. J. (1986). *The Anthropic Cosmological Principle*. Oxford.
5. Barrow, J. D. (1997). Anthropic Definitions. *Quarterly Journal of the Royal Astronomical Society* 24: 146 - 153
6. Benson, J., Dusek, J.A., Sherwood, J.B., Lam, P., Bethea, C.F., Carpenter, W., Levitsky, S., Hill, P.C., Clem Jr., D.W., Jain, M.K., Drumel, D., Kopecky, S.L., Mueller, P.S., Marek, D., Rollins, S., Hibberd, P.L. (2006). Study of the Therapeutic Effects of Intercessory Prayer (STEP) in cardiac bypass patients: a multicenter randomized trial of uncertainty and certainty of receiving intercessory prayer. *American Heart Journal*. 151 (4): 934 - 42. doi:10.1016/j.ahj.2005.05.028
7. Berger, J. (2006). The Case for Objective Bayesian Analysis. *Bayesian Analysis* 1, no. 3: 385 - 402
8. Betenson, T. G. (2015). *The problem of evil as a moral objection to theism*. Ph.D. thesis, University of Birmingham. <http://etheses.bham.ac.uk/5610/>
9. Bible, The. (King James Edition)
10. Bishop, J. (1993). Compatibilism and the Free Will Defence. *Australasian Journal of Philosophy*: 71
11. Bishop, J. (1998). Can There Be Alternative Concepts of God? *Noûs* 32, no. 2 (February 24, 1998): 174 - 88
12. Bishop, J. (2007a). How a Modest Fideism May Constrain Theistic Commitments: Exploring an Alternative to Classical Theism. *Philosophia*, 35: 387 - 402
13. Bishop, J. (2007b). *Believing by Faith: An Essay in the Epistemology and Ethics of Religious Belief*. New York: Clarendon.
14. Bostrom, N. (2002). *Anthropic Bias: Observation Selection Effects in Science and Philosophy*. London: Routledge
15. Boyce, K. (2012). The multiverse and the inverse gambler's fallacy: a response to Nick Bostrom on behalf of Roger White. *2013 Mountain-Pacific Conference of the Society of Christian Philosophers, Boulder Colorado, March 8-9, 2013*. URL: <https://kennethboyce.files.wordpress.com/2012/04/the-multiverse-and-the-inverse-gamblers-fallacy.doc>

16. Brosnan, S. F., de Waal, F. B. M. (2003). Monkeys Reject Unequal Pay. *Nature*: 425: 297-299. <http://www.nature.com/nature/journal/v425/n6955/full/nature01963.html>.
17. Brown, C. G., Mory, S. C., Williams, R., McClymond, M. J. (2010). Study of the Therapeutic Effects of Proximal Intercessory Prayer (STEPP) on Auditory and Visual Impairments in Rural Mozambique. *Southern Medical Journal* 103, no. 9: 864. doi:10.1097/SMJ.0b013e3181e73fea.
18. Brown, P. (1964). St. Thomas' Doctrine of Necessary Being. *The Philosophical Review*, Vol. 73, No. 1 (Jan., 1964), pp. 76-90
19. Carter, B. (1974). Large Number Coincidences and the Anthropic Principle in Cosmology. *IAU Symposium 63: Confrontation of Cosmological Theories with Observational Data*: 291-298, Dordrecht: Reidel.
20. Clark, K. J., and VanArragon, R. J. (Eds). Evidence and Religious Belief. *Mind* 122, no. 486 (November 10, 2013): 525 - 29. doi:10.1093/mind/fzt054.
21. Coley, S. (2015). Skeptical Theism Is Incompatible with Theodicy. *International Journal of the Philosophy of Religion*.
<http://link.springer.com/article/10.1007%2Fs11153-014-9494-x>.
22. Cottingham, J., Stoothoff, R., Murdoch, D. (1999). *The Philosophical Writings of Descartes, Volume II*. Cambridge: Cambridge University.
23. Craig, W. L. (1990). What Place, Then, for a Creator?: Hawking on God and Creation. *The British Journal for the Philosophy of Science*, Vol. 41, No. 4. 473-491.
24. Craig, W. L. (1991). The Existence of God and the Beginning of the Universe. *Truth: A Journal of Modern Thought* 3: 85-96
25. Craig, W. L. (1997). Hartle-Hawking Cosmology and Atheism. *Analysis*, 57(4). pp291 - 295.
26. Davidson, D. (1963). Actions, Reasons, and Causes. *Journal of Philosophy*, 60 (1963). pp685 - 700
27. Davidson, D. (1970). *Mental Events in Experience and Theory*. London: Duckworth.
28. Davies, P. (2007). *The Goldilocks Enigma*. London: Penguin.
29. Dawes, G. (2009). *Theism and Explanation*. New York: Routledge.
30. Dawkins, R. (2006). *The God Delusion*. Houghton Mifflin.
31. Dawkins, R. (2006). *The Root Of Evil*: BBC.
https://www.youtube.com/watch?v=8nAos1M-_Ts
32. de Boer, J. Moral Ape Philosophy. *Biology & Philosophy* 26, no. 6 (October 31, 2011): 891 - 904. doi:10.1007/s10539-011-9283-1.
33. Dennett, D. C. (1993). *Consciousness Explained*. London: Penguin.
34. Dennett, D. C., Kinsbourne, M. (1992). Escape from the Cartesian Theater. *Behavioural and Brain Sciences*, 15:2

35. Dennett, D. C., Kinsbourne, M. (1992). Time and the observer: The where and when of consciousness in the brain. *Behavioural and Brain Sciences*, 15:2
36. Draper, P. (1992). Probabilistic Arguments from Evil. *Religious Studies* (1992) vol. 28 (3) 303-317
37. Earman, J. (1992). The Problem of Old Evidence, in Earman, J. (Ed). (1994). *Bayes or Bust? A Critical Examination of Bayesian Confirmation Theory*, Chapter 5.
38. Edwards, R. B. (1968). Composition and the Cosmological Argument. *Mind, New Series*, Vol. 77, No. 305. 115-117.
39. Eells, E, Fitelson, B. (2000). Measuring Confirmation and Evidence. *The Journal of Philosophy* 97, no. 12 (December 1, 2000): 663 - 72. doi:10.2307/2678462
40. Eells, E. (1994/2011). Bayesian Problems of Old Evidence, in Earman, J. (Ed). (1994). *Bayes or Bust? A Critical Examination of Bayesian Confirmation Theory*, 205-223
41. Everett, H. (1957). *The Many-Worlds Interpretation of Quantum Mechanics*. PhD thesis. Princeton University.
42. Feeney, S. M., Johnson, M. C., Mortlock, D. J., Peiris, H. V. (2011). First Observational Tests of Eternal Inflation. *Journals.Aps.org. Phys. Rev. Lett.* 107, 071301. Accessed December 28, 2015.
<http://journals.aps.org/prl/abstract/10.1103/PhysRevLett.107.071301>.
43. Frankfurt, H. (1969). Alternate Possibilities and Moral Responsibility. *The Journal of Philosophy*, 66(23) 829 - 839.
44. Garriga, J., Vilenkin, A. (2001). Many worlds in one. *Physical Review D*. arXiv:gr-qc/0102010v2.
45. Giancoli, D. C. (1990). *Physics: Principles with Applications*. USA: Prentice-Hall.
46. Gielen, S., Turok, N. (2016) Perfect Quantum Cosmological Bounce. *Physical Review Letters* 117, 021301
47. Gwiazda, J. (2009). Richard Swinburne, The Existence of God, and Exact Numerical Values. *Philosophia*, 38(2). pp357 - 363. doi:10.1007/s11406-009-9216-2
48. Hacking, I. (1987). The Inverse Gambler's Fallacy: the Argument From Design. The Anthropic Principle Applied to Wheeler Universes. *Mind, New Series* 96, no. 383 (July 1, 1987): 331 - 340.
49. Hacking, I. (2008). *An Introduction to Probability and Inductive Logic*. Cambridge.
50. Hafele, J. (2011). Effects of the Sun's time-retarded gravitational field on the orbital motions of Mercury and Halley's Comet. *arXiv.org*:1201.0965.
51. Hájek, A. (1997). Mises Redux—Redux: Fifteen Arguments Against Finite Frequentism. *Erkenntnis*, 45: 209-227
52. Hájek, A. (2007). Interpretations of Probability. *Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.). <http://plato.stanford.edu/entries/probability-interpret/>

53. Hájek, A. (2009). Fifteen Arguments Against Hypothetical Frequentism. *Erkenntnis*, 70: 211 - 235
54. Hájek, A. (2009b). Dutch Book Arguments. Draft Chapter in Anand, P., Pattanaik, P., and Puppe, C. (2009). *The Handbook of Rational and Social Choice*. Oxford. ISBN: 9780199290420. Available as a draft at: <http://philrsss.anu.edu.au/people-defaults/alanh/papers/DBA.pdf> — Accessed 1 April 2016. DOI: <http://dx.doi.org/10.1093/acprof:oso/9780199290420.003.0008>
55. Hasker, W. (1984). Must God Do His Best? *International Journal for Philosophy of Religion*. Vol. 16 (3) 213-223
56. Hasker, W. (1992). Providence and Evil: Three Theories. *Religious Studies* (1992) vol. 28 (1) 91-105
57. Hasker, W. (2001). The Foreknowledge Conundrum. *International Journal for Philosophy of Religion* (2001) vol. 50 (1/3) 97-114
58. Hasker, W. (2002). Is Christianity Probable? Swinburne's Apologetic Programme. *Religious Studies*, 38(3). 253 - 264.
59. Hasker, W. (2005). Can God Be Free?: Rowe's Dilemma for Theology. *Religious Studies*. Vol. 41 (4) 453-462
60. Hasker, W. (2007). D. Z. Phillips' Problems with Evil and with God. *International Journal for Philosophy of Religion*, vol. 61 (3) 151-160
61. Hempel, C. G. (1965). *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science*. New York: Free Press.
62. Hempel, C.G. & Oppenheim, P. (1948). Studies in the Logic of Explanation. *Philosophy of Science*, XV: 135-175.
63. Hill, J. P. (2007). Review of van Inwagen, P. (2006). *The problem of evil*. *Ars Disputandi* 7
64. Holder, R. D. (2002). Fine-Tuning, Multiple Universes, and Theism. *Noûs*, 36:2, 295-312.
65. Holloway, R. (2004). *Godless Morality: Keeping Religion out of Ethics*. Edinburgh: Canongate
66. Howard-Snyder, D., Howard-Snyder, F. (1999). Is theism compatible with gratuitous evil? *American Philosophical Quarterly*, vol. 36 (2): 115-130
67. Howson, C. (1991). The 'Old Evidence' Problem. *British Journal for the History of Philosophy*, 42 (January 16, 1991): 547 - 55.
68. Howson, C. (2001). *Hume's Problem: Induction and the Justification of Belief*. Oxford: Oxford.
69. Howson, C. (2011). *Objecting to God*. New York: Cambridge. 123-135
70. Huberman, J. (2007). *The Quotable Atheist*. New York: Nation Books.
71. Hume, D. (1740). *A Treatise of Human Nature*. London: Penguin.

72. Hume, D. (1748). *An Enquiry Concerning Human Understanding*. London: Penguin
73. Hume, D. (date). *Dialogues Concerning Natural Religion*. London: Penguin
74. Jaynes, E. T. (1988). The Relation of Bayesian and Maximum Entropy Methods. *Maximum-Entropy and Bayesian Methods in Science and Engineering* (Vol. 1), Kluwer: 25-29.
75. Juhl, C. (2005). Fine-Tuning, Many Worlds, and the 'Inverse Gambler's Fallacy'. *Noûs* 39, no. 2 (June 2005): 337 - 347. doi:10.1111/j.0029-4624.2005.00504.x.
76. Juhl, C. (2006). Fine-tuning is not surprising. *Analysis*: 66.4: 269 - 75.
77. Kadane, J. (2006). Is 'Objective Bayesian Analysis' Objective, Bayesian, or Wise? (Comment on Articles by Berger and by Goldstein). *Bayesian Analysis* 1, no. 3 (July 5, 2006): 433 - 36.
78. Kant, I. (1999). *Critique of Pure Reason (The Cambridge Edition of the Works of Immanuel Kant)*. Guyer, P., Wood, A. W. (Eds.). Cambridge: Cambridge University Press.
79. Kass, R. E, and Wasserman, L. (1996). The Selection of Prior Distributions by Formal Rules. *Journal of the American Statistical Association*. Vol 91, No. 435.
80. Keller, J. A. (2010). Review of Rhoda: Problems of Evil and the Power of God. *Ars Disputandi* (2010) vol. 10.
81. Kelly, K. (2007). A new solution to the puzzles of simplicity. *Philosophy of Science* 74 (5): 561-573
82. Lamont, J. (1997). Aquinas on Divine Simplicity. *The Monist* 80, no. 4: 521 - 38. doi:10.5840/monist199780424.
83. Lang, G. R. (2012). Theodicy and the Non-Identity Problem. *Pre-publication presentation notes supplied at presentation at the University of the Witwatersrand*, 30 August 2012.
84. Larivée, S., Sénéchal, C., Chénard, G. (2012). Les côtés ténébreux de Mère Teresa. *Studies in Religion / Sciences Religieuses*. 1-27. DOI: 10.1177/0008429812469894
85. Leibniz, G. W. (1697). *On the Radical Origination of Things*. Available online.
86. Leibniz, G. W. (1710). *Theodicy*. Available online.
87. Leibniz, G. W. (1714). *The Principles of Nature and Grace, based on Reason*. Available online.
88. Leon, M. (1999). On the Value and Scope of Freedom. *Ratio*, vol. 12. (1999)
89. Leon, M. (2001). The Willing Addict: Actor or (helpless) Bystander? *Philosophia*, Volume 28
90. Leon, M. (2002). Responsible Believers. *The Monist*, vol. 85, no. 3
91. Leslie, J. (1988). No Inverse Gambler's Fallacy in Cosmology. *Mind, New Series* 97, no. 386 (April 1, 1988): 269 - 272.
92. Leslie, J. (1989). *Universes*. London: Routledge

93. Leslie, J. (2000). Our Place in the Cosmos. *Philosophy*, Vol. 75, 2000.
94. Lewis, D. (1973) *Counterfactuals*, Oxford: Basil Blackwell.
95. Lewis, D. (1983). New work for a theory of universals. *Australasian Journal of Philosophy*. 61: 343-377
96. Lewis, D. (1993). Evil for Freedom's Sake? *Philosophical Papers* 22
97. Mackie, J. L. (1955). Evil and omnipotence. *Mind* vol. 64 (254): 200-212
98. Mackie, J. L. (1982). *The Miracle of Theism*. Oxford: Clarendon.
99. Martin, E. (1978). Is Evil Evidence Against the Existence of God? *Mind*, vol. 87 (3): 429
100. Masters, K., Spielmans, G., Goodson, J. (2006). Are there demonstrable effects of distant intercessory prayer? A meta-analytic review. *Annals of Behavioral Medicine*. August. 32(1):21-6.
101. McCloskey, H. J. (1960). God and evil. *The Philosophical Quarterly*, vol. 10 (39): 97-114
102. McGrath, P. J. (1988). The Inverse Gambler's Fallacy and Cosmology — A Reply to Hacking. *Mind, New Series* 97, no. 386: 265 - 268.
103. Melamed, Y. and Lin, M., "Principle of Sufficient Reason", *The Stanford Encyclopedia of Philosophy (Fall 2016 Edition)*, Edward N. Zalta (ed.), <http://plato.stanford.edu/archives/fall2016/entries/sufficient-reason/> -- Accessed Nov 2016
104. Monton, B. (2006). God, Fine-Tuning, and the Problem of Old Evidence. *British Journal of the Philosophy of Science*. 57: 405 - 424
105. Nagasawa, Y., Oppy, G., Trakakis, N. (2004). Salvation in heaven? *Philosophical Papers*. vol. 33 (1): 97-119
106. Nagel, T. (1974). What Is It Like to Be a Bat?, in Block, N. (1980). *Readings in Philosophy of Psychology. Vol. 1*. Cambridge, Mass.: Harvard.
107. Narlikar, J. V. (1992). The Concepts of Beginning and Creation in cosmology. *Philosophy of Science*, Vol. 59, No. 3: 361-371
108. Newton-Smith, W. H. (1996). *The Rationality of Science*. London: Routledge.
109. Norton, J. D. (2014). Simplicity as a Surrogate. Draft Chapter of Book: *The Material Theory of Induction*. Available on request from author. http://www.pitt.edu/~jdnorton/papers/material_theory/6.%20Simplicity.pdf
110. O'Leary-Hawthorne, J., Howard-Snyder, D. (1993). God, Schmod and Gratuitous Evil. *Philosophy and Phenomenological Research*, vol. 53 (4): 861-874
111. Oppenheimer, P. E., Zalta, E. N. (2011). A Computationally-Discovered Simplification of the Ontological Argument. *Australasian Journal of Philosophy*, 89(2): 333 - 349.
112. Ostrowick, J. (2013). Does Evolution Really Threaten Religion? *Journal of Theology for Southern Africa*, Issue 146 July 2013

113. Ostrowick, J. (2016). A Scientific Model of Pantheism. *South African Journal of Philosophy*, Volume 35, Issue 3, 2016.
<http://dx.doi.org/10.1080/02580136.2016.1209922>
114. Pargetter, R. (1976). Evil as Evidence against the Existence of God. *Mind*. Vol. 85 (338): 242
115. Peirce, C. S. (1878). How to Make Our Ideas Clear. *Popular Science Monthly* 12 (January 1878), 286-302.
116. Penrose, R. (1989). *The Emperor's New Mind*. Oxford: OUP.
117. Pereboom, D. (2001). *Living Without free-will*. Cambridge.
118. Pereboom, D. (2012). Theological Determinism and Divine Providence, in Perszyk, K. (ed). *Molinism: The Contemporary Debate*. Oxford: Oxford
119. Pereboom, D. (2013). A Defense without Free Will, in Howard-Snyder, D., McBrayer, J. (eds). *The Blackwell Companion to the Problem of Evil*. Oxford: Blackwell.
120. Peterson, M., Hasker, W., Reichenbach, B., Basinger, D. (1996). *Philosophy of Religion — Selected Readings*. New York: Oxford
121. Pike, N. (1966). Plantinga on the Free Will Defense: A Reply. *The Journal of Philosophy*. Vol. 63 (4): 93-104
122. Plantinga, A. (1966). Pike and Possible Persons. *The Journal of Philosophy*. Vol. 63 (4): 104-108
123. Plantinga, A. (1979). The Probabilistic Argument from Evil. *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition*. Vol. 35 (1): 1-53
124. Plantinga, A. (1980). *Does God Have a Nature?* Milwaukee: Marquette University Press.
125. Plantinga, A. (1981). Is Belief in God Properly Basic? *Noûs*. Vol. 15 (1): 41-51
126. Plantinga, A. (1991). The Prospects for Natural Theology. *Philosophical Perspectives*. Vol. 5: 287-315
127. Plantinga, A. (1998). Degenerate Evidence and Rowe's New Evidential Argument from Evil. *Noûs*. 531-544
128. Plantinga, A., Tooley, M. (2008). *Knowledge of God*. Oxford: Blackwell
129. Popper, K. (1959b). The Propensity Interpretation of Probability. *The British Journal for the Philosophy of Science*, 10 (37): 25 - 42.
130. Popper, K. R. (1959). *The Logic of Scientific Discovery*. New York: Basic Books.
131. Popper, K. R. (1962). *Conjectures and refutations. The growth of scientific knowledge*. New York: Basic Books.
132. Proctor, D., Williamson, R.A., de Waal, F.B.M., and Brosnan, S.F. (2013) Chimpanzees Play the Ultimatum Game. *Proceedings of the National Academy of Sciences of the United States of America* 110, no. 6 (February 5, 2013): 2070 - 75.
[doi:10.2307/41992181?ref=search-gateway:01e08c95f43edd7eab05b0fbc3416a65](https://doi.org/10.2307/41992181?ref=search-gateway:01e08c95f43edd7eab05b0fbc3416a65).

133. Ratzsch, D. (2005). Teleological Arguments for God's Existence. *Stanford Encyclopedia of Philosophy*. Edward N. Zalta (ed.).
<http://plato.stanford.edu/entries/teleological-arguments/>
134. Resnik, M. D. (1987). *Choices. An Introduction to Decision Theory*. Minneapolis: Minnesota.
135. Rhoda, A. (2010). Gratuitous evil and divine providence. *Religious Studies*. Vol. 46 (03): 281-302
136. Riesch, H. (2010). Simple or Simplistic? Scientists' Views on Occam's Razor. *Theoria*, 67:75-90.
137. Rowe, W. L. (1979). The Problem of Evil and Some Varieties of Atheism. *American Philosophical Quarterly*. Vol. 16 (4): 335-341
138. Rowe, W. L. (1991). Ruminations about Evil. *Philosophical Perspectives*. Vol. 5: 69-88
139. Rowe, W. L. (1998). In Defense of 'The Free Will Defense': Response to Daniel Howard-Snyder and John O'Leary-Hawthorne. *International Journal for Philosophy of Religion*. Vol. 44 (2): 115-120
140. Rowe, W. L. (1998b). Reply to Plantinga. *Noûs*. Vol. 32 (4): 545-552
141. Rowe, W. L. (2005). Response to Hasker. *Religious Studies*. Vol. 41 (4): 463-466
142. Rowe, W. L. (2006). Friendly Atheism, Skeptical Theism, and the Problem of Evil. *International Journal for Philosophy of Religion*. Vol. 59 (2): 79-92
143. Russell, B. (1928). Why I am not a Christian. Available online, e.g.
<https://www.andrew.cmu.edu/user/jksadegh/A%20Good%20Atheist%20Secularist%20Skeptical%20Book%20Collection/Why%20I%20am%20Not%20a%20Christian%20-%20Bertrand%20Russell.pdf>
144. Samuelson, N. (1972). That the God of the Philosophers Is Not the God of Abraham, Isaac, and Jacob. *The Harvard Theological Review*, 65(1):1 - 27.
145. Schellenberg, J. L. (2000). Stalemate and Strategy: Rethinking the Evidential Argument from Evil. *American Philosophical Quarterly* (2000) vol. 37 (4): 405-419
146. Schulte, O. (1999). Means-end epistemology. *British Journal for the Philosophy of Science*, 50, 1-31.
147. Searle, J. R (2001). Free Will as a Problem in Neurobiology. *Philosophy*, 76(04).
doi:10.1017/S0031819101000535
148. Silver, D. (2002). Religious experience and the evidential argument from evil. *Religious Studies* 38: 339 - 353
149. Simpson, R. (2009a). Moral Antitheodicy: Prospects and Problems. *International Journal of Philosophy of Religion*, January 5, 2009.
<http://link.springer.com/article/10.1007%2Fs11153-008-9189-2>.

150. Simpson, R. (2009b). Some Moral Critique of Theodicy Is Misplaced, but Not All. *Religious Studies*. Vol. 45, No. 3, 339-346. <http://www.jstor.org/stable/27750022>.
151. Sober, E. (1994). Let's razor Ockham's razor. In *From a biological point of view: Essays in Evolutionary Philosophy*. Cambridge University Press.
152. Sober, E. (1995). *Core Questions in Philosophy*. Prentice Hall: Englewood Cliffs
153. Sober, E. (2003). The Design Argument, in Manson, N (ed.). *God and Design: The Teleological Argument and Modern Science*. London: Routledge:
154. Sober, E. (2015) *Ockham's Razors: A User's Manual*. Cambridge: Cambridge
155. Sober, E. (2016). *Why is simpler better?* <https://aeon.co/essays/are-scientific-theories-really-better-when-they-are-simpler>. Accessed 9 Sept 2016.
156. Stenger, V. J. (2009). *The New Atheism*. Amherst, NY: Prometheus Books.
157. Stenger, V. J. (2011). *The Fallacy of Fine-Tuning: Why the Universe is Not Designed for Us*. Amherst, NY: Prometheus Books.
158. Stenger, V. J. (2013). Where Do the Laws of Physics Come From? *Preprint. PhilSci Archive*. <http://philsci-archive.pitt.edu/archive/00003662/>.
159. Stump, E. (1985). Suffering and Redemption: A Reply to Smith. *Faith and Philosophy*, 2: 430-5
160. Stump, E., Murray, M. J. (1999). *Philosophy of Religion: The Big Questions*. Oxford: Blackwell
161. Swinburne, R. (1968). The argument from design. *Philosophy*, vol. 43 (165): 199-212
162. Swinburne, R. (1977). The Problem of Evil, in Brown, S. (ed.), *Reason and Religion*. Ithaca: Cornell University Press: 81-102
163. Swinburne, R. (1995). Theodicy, Our Well-Being, and God's Rights. *International Journal for Philosophy of Religion*, 38: 75-91
164. Swinburne, R. (1996). *Is There a God?* Oxford: Clarendon
165. Swinburne, R. (1997). *The Aquinas Lecture 1997: Simplicity as Evidence for Truth*. Oxford: Oxford.
166. Swinburne, R. (2001). *Epistemic Justification*. Oxford: Clarendon
167. Swinburne, R. (2004). *The Existence of God*, Revised Edn. Oxford: Clarendon
168. Timpe, K., and Speak, D. (Eds.) (2016). *Free Will and Theism: Connections, Contingencies, and Concerns*. Oxford: Clarendon.
169. Tipler, F. J. (1982). Anthropic-principle arguments against steady-state cosmological theories. *Observatory* 102: 36 - 39.
170. Turner, D. (2003). in Miller, J., *The Atheism Tapes*. BBC Channel 4.
171. Van Brakel, J. (1988). Is Our Universe a Mere Fluke? The Cosmological Argument and Spinning the Universes. *Proceedings of the Biennial Meeting of the Philosophy of Science Association*, Volume One: Contributed Papers: 75-82

172. Van Inwagen, P. (1988). The Magnitude, Duration, and Distribution of Evil. *Philosophical Topics*, 16(2): 161 - 187.
173. Van Inwagen, P. (1999). Moral Responsibility, Determinism, and the Ability to Do Otherwise. *The Journal of Ethics* 3, no. 4 (1999): 341 - 50.
174. Van Leeuwen, N. (2014). Religious Credence Is Not Factual Belief. *Cognition* 133 (October 18, 2014): 1 - 37.
175. Vankov, A. A., (2014). Einstein's Paper: Explanation of the Perihelion Motion of Mercury from General Relativity Theory. *The General Science Journal*: Aug. 2014. <http://www.gsjournal.net/Science-Journals-Papers/Author/461/Anatoli%20Andrei,%20Vankov>.
176. Vilenkin, A. (2006). *Many Worlds in One: The Search for Other Universes*. Hill and Wang.
177. Wainwright, W. J. (2005). *The Oxford Handbook of Philosophy of Religion*. Oxford.
178. Walls, J. L. (1991). Why Plantinga Must Move from Defense to Theodicy. *Philosophy and Phenomenological Research*, Vol. 51, No. 2: 375-378
179. Warneken, F. (2006). Altruistic Helping in Human Infants and Young Chimpanzees. *Science* 311, no. 5765: 1301 - 3. doi:10.1126/science.1121448
180. Whitaker, M. A. B. (1988). On Hacking's Criticism of the Wheeler Hypothesis. *Mind* 97: 259 - 264.
181. White, R. (2000). Fine-Tuning and Multiple Universes. *Noûs* 34, no. 2: 260 - 276.
182. Wilks, I. (2004). The Structure of the Contemporary Debate on the Problem of Evil. *Religious Studies* vol. 40 (3): 307-321
183. Williamson, J. (2005). *Bayesian nets and causality*. Oxford: Oxford University Press.
184. Williamson, J. (2008a). Objective Bayesian probabilistic logic. *Journal of Algorithms*, 63(4): 167 - 183. doi:10.1016/j.jalgor.2008.07.001
185. Williamson, J. (2010). *In Defence of Objective Bayesianism*. Oxford: Oxford.
186. Wolterstorff, N. (1991). Divine Simplicity, in *Philosophical Perspectives 5: Philosophy of Religion*: 531-52. doi:10.2307/2214108.
187. Xia, J. Q., Cai, Y. F., Li, H., Zhang, X. (2014). Evidence for Bouncing Evolution Before Inflation After BICEP2. *Physical Review Letters* 112, no. 25 (June 26, 2014): 251301. doi:10.1103/PhysRevLett.112.251301.